Immigration at Low Ebb—Page 1537

THE IRON TRADE REVIEW

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American Foundry and Machine

Convention and Exhibition
Rochester, N. Y.
June 5 to 9th

Regardless of trade conditions, the Convention and Exhibition continues to grow.

This fact is the greatest proof of its value.

During dull times, foundrymen and those connected with allied industries would not attend unless convinced that they were making a good investment of time and money.

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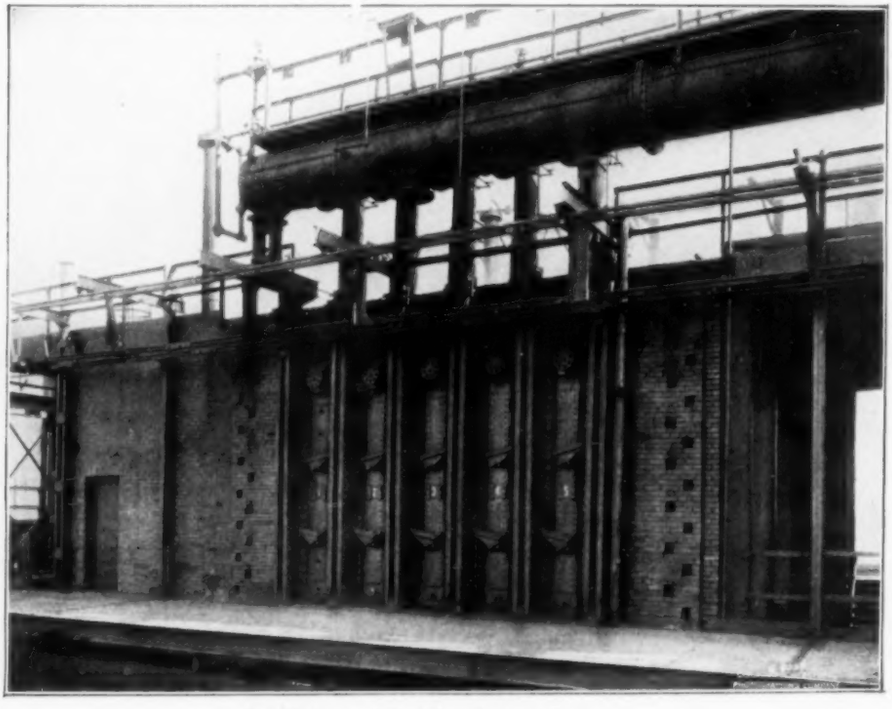
"Every Possible Kind for Every Possible Purpose"

The New Koppers Oven

The Iron and Steel industry will welcome the development and successful operation of **THE NEW KOPPERS OVEN**, backed as it is by the accumulated knowledge and experience gained in designing and building over 6700 by-product coke ovens.

A battery of these **NEW KOPPERS OVENS** has been in operation at the plant of the Chicago By-Product Coke Co. since January. The average coking time has been under 11 hours and at times has been less than 10 hours. On this basis, each of these ovens has a coking capacity of from 25 to 26 tons of coal per day.



Battery of Five New Koppers Ovens

Remarkable as the above performance is, the quality of the coke produced is even more so. In stating that the use of coke made in these New Koppers Ovens will make possible greatly improved blast furnace practice and materially lower the consumption of coke per ton of iron produced, we are only repeating the unanimous opinion of the experts who have inspected these ovens and examined the coke produced.

We unhesitatingly recommend the **NEW KOPPERS OVEN** to our customers in preference to our old design.

The KOPPERS COMPANY
Designers and Builders of
By-Product Coke & Gas Ovens
PITTSBURGH, PA.

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JUN -3 1922

Vol. LXX

THE IRON TRADE REVIEW

Registered U. S. Patent Office

No. 22

Cleveland, June 1, 1922

Rate Reduction Is Small Factor

Announced Freight Revision Promises To Have Slight Effect on Costs or Market—Iron Ore Situation Unsettled, However—Building Awards Equal Full Fabricating Capacity —Third Quarter Sheet and Tin Plate Prices Awaited—Coke Higher

BUYING is going along in good volume in iron and steel but deferred deliveries are having a tendency to hold the new tonnage in check. Producers are exhibiting more caution in adding to their obligations with the fuel situation clearing so slowly. Production is more on a level this week.

More urgent demands for coke are appearing as the coal strike drags on and conditions in the Connellsville region show slow improvement. This is accountable mainly to the efforts of various producers to get fuel to start idle blast furnaces. Furnace coke is higher at $6.50 to $7 and foundry at $7 to $7.50 Connellsville.

Foreign trade in iron and steel is making a favorable showing. April exports were 197,562 tons which excepting March with 206,474 tons was the best in 13 months. Imports were 15,884 tons compared with 8612 tons in March and the highest in 12 months.

Another week of slight change is shown by THE IRON TRADE REVIEW's market composite of fourteen iron and steel products. The average is $36.64 compared with $36.62 one week and $36.60 two weeks ago. The May average was $36.49 against $34.42 in April, $32.97 in March and $32.86 in February.

Freight Cut Unsettles

Announcement of the general freight reduction has served to unsettle the iron ore situation. The 10 per cent reduction ordered by the interstate commerce commission apparently only applies to the rail haul from lower lake ports but if the effective date is kept July 1, shippers feel little tonnage will be moved down before that time. This would further restrict ore supplies in an already backward shipping season. A strong effort is being made to induce the railroads to put the reduction in effect at once and also to extend it to the upper lake rail rates which now it does not cover. The question will come to a head at meetings in Chicago and Washington this week with the railroad executives. Until these matters are settled, no announcement of the season's ore prices can be expected.

Generally the rate reduction is regarded as a negligible factor from either a cost or market standpoint in iron and steel. As it stands today, without a lower rate on ore from the mines to upper lake docks, the assembling cost of the materials to make a ton of pig iron in the Mahoning valley will be cut approximately 60 cents a ton and of steel, from 75 cents to $1 a ton. A 10 per cent reduction on upper lake rail rates would add 20 to 25 cents of this saving.

Sheet Rise Awaited

The third quarter market on sheets and tin plate is about to be opened. The common expectation is some advance on sheets will be asked as buyers are clamoring to be covered. A Chicago producer has advanced $2 per ton on blue annealed and $3 on black and galvanized. Considerable sheet bar inquiry is current for third quarter including one lot of 7500 tons but few makers will sell so far ahead. On 1000 tons of prompt bars, $36 Youngstown was paid.

The railroads, especially in the Middle West continue to press hard for rail deliveries on contract. The Gary mill now is producing 10,000 tons weekly and will increase this soon if the steel can be provided. The week's car awards were 2750.

Pig iron buying has simmered down to a modest tonnage though in New England and eastern Pennsylvania, melters seem to be returning to the market again. Philadelphia reports sales of 25,000 tons this week which is the best showing. Active shipments are universely reported. The Ford Motor Co. has notified foundries which it now is supplying iron from its blast furnace that it will be unable to furnish tonnage in June, July and August. More lots of British iron are under negotiation by American buyers at $24 to $25 tidewater.

Awards at Capacity

The scope of recent building activity is shown by the initial report of structural steel awards compiled by the census bureau and covering the month of April. On the basis of two-thirds of total shop output, awards for the whole country were 177,600 tons, or 99 per cent of fabricating capacity. This compares with 139,300 tons, or 77 per cent of capacity reported for March by the Bridge Builders and Structural society. Awards this week total 18,560 tons.

Business Trend and Chart Section Page 1535

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Rate Decision Is Disappointing

AFTER many months of expectant waiting the country has been treated to the decision by the interstate commerce commission for a 10 per cent general reduction in railroad freight rates effective July 1. This will leave the average rate level 65 per cent above the basis prevailing before the war.

It scarcely needs to be said that the reduction both in form and amount is disappointing to the country's business interests as a whole, with the single exception of the railroads themselves. A larger cut and a more scientific and effective application of the warranted readjustment had been looked for by the shipping public. As it stands, the reduction offers little relief to the distorted situation in the bulk commodities especially iron and steel, whereas it makes an equal concession to the lighter goods where the compounded rate charge has not been a material factor in business.

It is clear the course of the commerce commission in not making a discriminating reduction in commodity rates where it most was needed, is not approved by the President and other influential members of the present administration who have been working for a readjustment in accordance with the greatest economic necessities. Moreover, the commission does not add anything for its judicial reputation when it declares in its decision that under present conditions of fluctuating markets, reductions should be "made generally upon all commodities in substantially equal ratio." This is contrary to the common conception of scientific rate making.

In iron and steel, the rate reduction will have small weight in lowering production costs where it is calculated that the reduction in the assembling of the five tons or so of raw materials to make a ton of pig iron at a typical producing point such as the Mahoning valley, is less than 60 cents. This leaves the total freight charges approximately $3.66 per ton above that of Jan. 1, 1913, or 74 per cent. Per ton of steel the reduction would not exceed 75 cents to $1.

If business had relied upon the expected freight readjustment to raise it from its months of lethargy, the present disappointment would be a more serious matter. Happily business recently has moved ahead on its own accord and for the time being seems independent of freight rate considerations, so insistent is the reviving demand. In the end, however, a just reapportionment of freight charges must underlie permanent economic recovery. It is to be hoped, therefore, that the action just announced by the interstate commerce commission is only the preliminary step to complete an equitable rate readjustment.

Vision—Forerunner of Achievement

A HUM-DRUM sort of world this is, our daily tasks hedging us close about, circumscribing ordinary mortals within close confines of thought, speech and action. The average man finds it difficult to get away from a strictly matter-of-fact viewpoint, considering little more than the solutions of the problems with which he is immediately confronted. What a refreshing experience it was, therefore, for the 1100 representatives of the iron and steel industry who heard the speech of Dr. John S. Unger at the banquet of the American Iron and Steel institute! How rudely he rocked all the accepted theories about conservative speech.

His vision of the future of the steel industry discloses a continuously-pouring blast furnace 25 feet high. He sees seamless tubing blown like glass. Ten, 25 or 50 years hence, the unloading of a cargo of iron ore in six hours will be "old fashioned stuff;" then ore vessels will be taken out of the water, turned upcide down, the ore dumped out and the boat, in the short space of 30 minutes, will be on her way back up the lakes for another load of ore. Coal is not going to continue to be transported by present expensive methods but will be pulverized at the mines and pumped through 8-foot pipe lines to the consumption point. Finally, when steel consumption in China and other countries reaches the proportions of that in the United

...es, and half a million tons of steel will be con...ed every 24 hours, we are not going to have steel a...ll. By that time the high-grade iron ore reserves w... have been exhausted and we will use a kind of l...n, a mixture of aluminum, silicon and iron.

...t the bold flights of Dr. Unger's imagination, it cannot be told to what extent his remarks were prophetic and to what extent fanciful. A brief time back the telephone, and then the wireless, were in the dream stage. A single lifetime spans the discovery and invention of articles, processes and conveniences without which our modern existence would be impossible. Every day marks some fresh development in our progress. Fortunate the man of whose life there remains another 10, 25 or 50 years; for he then will see things which now are not yet even in the dream stage. Perhaps Dr. Unger's vision is extravagant. The probability, however, is that he does not begin to visualize the things that are about to be unfolded to us. Certain it is, however, that all of these things must originate in the dream state. They must be conceived to be carried out, and it will be men of Dr. Unger's type, unafraid to dream and even to state their dreams, who will bring these things into being.

Marks Upturn in Casting Industry

DURING the past few weeks a noticeable improvement in the demand for foundry equipment and supplies has been reported. Molding machines, sand blast apparatus, flasks and sundry supplies have been selling in volume not exceeded since the profitable days of 1919 and 1920. The renewed activity is most encouraging to all engaged in the casting industry because it indicates that the foundry operators, as well as the equipment manufacturers, are actually emerging from the disastrous slump of 1921.

This slow but sure recovery forms a peculiarly appropriate setting for the twenty-sixth convention and exhibit of the American Foundrymen's association to be held in Rochester next week. Even under ordinary circumstances this annual meeting is the crowning event on the calendar of many producers of castings and makers of equipment, but with the industry entering a period of prosperity, the convention assumes the additional function of symbolizing the new status of foundry business. Moreover, the Rochester show affords the first opportunity since 1920 for American foundry equipment to be displayed before a representative assembly of producers of castings.

All business and professional men identified with the foundry industry will do well to attend the convention and exhibit. It will help them to regain the true perspective of business conditions and to bring down to date their knowledge of the foundry field. Much of what they hear and see at Rochester next week will help in meeting the competition which is approaching hand in hand with increasing demand.

Indispensable Guide

Is THE IRON TRADE REVIEW and Business Trend Section, Subscribers Everywhere Declare

I HAVE been much interested in studying the chart showing the TREND OF BUSINESS over a term of years. I have been unable to think of any way in which you could improve this in the interest of the clients you serve. Your editorial comments are always interesting and constructive.—*The Colorado Fuel & Iron Co., Denver, J. F. Welborn, president.*

The information about metal markets carried in THE IRON TRADE REVIEW is very satisfactory. We could not think of operating without the assistance of your trade journal. The charts you publish are very highly appreciated. The writer removes these, and has them on file by themselves.—*Richardson Road Machinery, Saskatoon, Sask., C. N. Richardson.*

The weekly presentation of the BUSINESS TREND has been of great interest to us and we trust that it will be continued as a permanent feature of the Review.—*The United Security Co., Canton, O., R. L. Rice.*

Warship Scrap Should Be Saved

AMONG stupid and unreasoned suggestions, the one that American warships, to be scrapped as a result of the recent limitation of arms conference, be sunk at sea, undoubtedly deserves a premier place. Here is much good steel, hundreds of thousands of tons of it, won from the earth and brought from iron ore to its present state by countless hours of human toil and expensive processes. Resources of high grade iron ore in this country are within measurable distance of depletion, and the supply of iron and steel scrap is not equal to demand. Yet the attitude that the ships should be sunk prevails in high circles in the government.

It is with considerable satisfaction, therefore, that the recommendation of the special naval board, which was appointed to formulate instructions for carrying out the scrapping rules of the arms conference, is noted by the iron and steel industry. After considering four practicable methods of disposition, including that of sinking sea, the board recommends that the ships be sold outright to the highest bidder. One of the considerations which prompted the suggestion that the ships be sunk at sea was the belief that the cost of scrapping them would be prohibitive.

The scrap in these vessels is needed by American industry. If it is too expensive to convert them into marketable scrap at this time, the ships by no means should be sunk. If no other disposition is found for them, they at least can be towed up some quiet stream, rendered unfit for warlike purposes, and left to be scrapped by future generations.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

May 29, 1922	May 24, 1922	April, 1922	February 1922	May, 1921	May, 1913
$36.64	$36.62	$34.42	$32.86	$43.32	$27.34

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Composite Market Record by Months for Nine Years on Page 1614

SCRAP PRICES, PAGE 1610, WAREHOUSE, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1606

Iron and Steel Prices

Pig Iron

Bessemer, valley	$25.00
Bessemer, Pittsburgh	26.96
Basic, valley	25.00
Basic, Pittsburgh	26.96
Basic, Buffalo	23.00 to 23.50
Basic del., eastern Pa.	25.00 to 25.50
Malleable, valley	25.00
Malleable, Pittsburgh	26.96
Malleable, Chicago	23.00
Malleable, Buffalo, furnace	22.50 to 23.50
Malleable, del., eastern Pa.	25.50 to 26.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del. Phila.	27.34 to 29.26
No. 1X, Buffalo	23.00 to 24.00
No. 2 foundry, valley	24.00 to 25.00
No. 2 foundry, Pittsburgh	25.96 to 26.96
No. 2 foundry, Buffalo	22.00 to 23.00
No. 2 foundry, Chicago	23.00
No. 2 foundry, Granite City	24.50
No. 2 foundry, Ironton furnace	23.00 to 24.00
No. 2 foundry, Cleveland del.	24.50
No. 2 foundry, del., Phila.	24.84 to 26.32
No. 2 foundry, N. J. tidewater	25.76 to 26.96
No. 2X, eastern del. Phila.	25.84 to 27.26
No. 2X, east. N. J. tidewater	26.26 to 27.96
No. 2X, eastren del. Boston	29.06 to 30.06
No. 2X, foundry, Buffalo fur.	22.50 to 23.50
No. 2X, Buffalo del. Boston	28.46 to 29.46
No. 2 southern, Birmingham	18.00 to 19.00
No. 2 southern, Cincinnati	22.50 to 23.50
No. 2 southern, Chicago	24.66 to 25.66
No. 2 southern, Philadelphia	26.56 to 27.66
No. 2 southern, Cleveland	24.66 to 25.66
No. 2 southern, Boston	28.66 to 29.66
No. 2 southern, St. Louis	23.72 to 24.72
No. 2X, Virginia furnace	23.50
No. 2X, Virginia Phila.	29.24
No. 2X, Virginia Jersey City	29.66
No. 2X, Virginia Boston	30.08
Gray forge, eastern Pa.	25.00 to 26.00
Gray forge, val. del. Pitts.	25.96
Low phos., standard, valley	33.00 to 34.00
Low phos., standard, Phila.	35.35
Low phos., Lebanon furnace	30.00
Charcoal, Birmingham	28.00 to 32.00
Charcoal, Superior, Chicago	29.00

Silvery Iron
8 per cent base

Jackson county, O., furnace	32.50
Tennessee, Chicago delivery	Nominal
Ohio brands, Chicago	37.82

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 per cent	41.50
11 per cent	44.80
12 per cent	48.10
13 per cent	52.10
14 per cent	57.10

Ferroalloys

Ferromanganese, delivered, Pittsburgh	$72.82 to 77.82
Ferromanganese, 80 per cent, English, c.i.f. Atlantic port	67.50
Ferromanganese, 80 per cent, German, c.i.f. Atlantic port	66.00
Spiegel, 19 to 21 per cent furnace spot, nominal	35.00
Ferrosilicon, 50 per cent, contract delivered	57.50 to 62.50
Ferrotungsten, standard, per pound contained	40.00c to 45.00c
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, per pound contained, makers plant	11.50cto 12.00c
Imported ferrochrome, 4 to 6 per cent carbon	11.00c to 11.25c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$6.50 to 7.00
Connellsville foundry	7.00 to 7.50
Pocahontas furnace	5.00 to 6.00
Pocahontas foundry	6.00 to 7.00
New River furnace	6.50 to 7.50
New River foundry	7.50 to 8.00
Wise county furnace	5.00 to 5.50
Wise county foundry	6.00 to 6.50
Alabama furnace	4.00 to 5.00
Alabama foundry	5.50 to 6.00
Alabama pitch coke	8.00 to 9.00

By-Product

Foundry, Newark, N. J., del.	$9.84 to 11.24
Foundry, Chicago, ovens	11.25
Foundry, Boston, delivered	10.15
Foundry, Granite City, Ill., ovens	9.00

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$35.00
Open-hearth, Youngstown	35.00
Open-hearth Philadelphia	39.24 to 40.74
Bessemer, Pittsburgh	35.00
Bessemer, Youngstown	35.00
Forging, Philadelphia	44.24 to 46.74
Forging, Pittsburgh	38.00 to 40.00

SHEET BARS

Open-hearth, Pittsburgh	$35.00
Open-hearth, Youngstown	35.00
Bessemer, Pittsburgh	35.00
Bessemer, Youngstown	35.00

SLABS

Pittsburgh and Youngstown	$34.00 to 35.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$38.00 to 40.00
Grooved skelp, Pittsburgh	1.60c to 1.75c
Universal skelp, Pittsburgh	1.60c to 1.75c
Sheared skelp, Pittsburgh	1.60c to 1.75c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	1.60c to 1.75c
Structural shapes, Phila.	1.86c to 2.06c
Structural shapes, New York	1.88c to 2.08c
Structural shapes, Chicago	1.70c to 1.80c
Tank plates, Pittsburgh	1.60c to 1.75c
Tank plates, Philadelphia	1.86c to 2.06c
Tank plates, New York	1.88c to 2.08c
Tank plates, Chicago	1.70c to 1.80c
Bars, soft steel, Pittsburgh	1.60c to 1.75c
Bars, soft steel, Philauelphia	1.86c to 2.06c
Bars, soft steel, New York	1.88c to 2.08c
Bars, soft steel, Chicago	1.70c to 1.80c
Bars, hard steel, Chicago	1.65c
Reinforcing bars, Pittsburgh	1.60c to 1.75c
Bar iron, common, Phila.	1.96c to 2.06c
Bar iron, common, New York	1.98c to 2.08c
Bar iron, common, Chicago	1.70c to 1.75c

Hoops, Bands, Shafting

Hoops, Pittsburgh	2.25c to 2.50c
Bands, Pittsburgh	2.25c to 2.50c
Cold finished steel bars, Pittsburgh base	2.00c

Rails, Track Material

Standard bessemer rails, mill	$40.00
Standard open hearth rails, mill	40.00
Relaying rails, St. Louis	24.00 to 28.00
Relaying rails, Pittsburgh	24.00 to 27.00
Light rails, 25 to 45, mill	1.50c to 1.60c
Angle bars, Chicago base	2.40c
Spikes, railroad, Pittsburgh	2.25c
Spikes, small and boat	2.50c
Spikes, railroad, Chicago	2.88c
Track bolts, Pittsburgh	3.00c to 3.50c
Track bolts, Chicago	3.88c
Tie plates, Pittsburgh	1.75c to 1.90c
Tie plates, Chicago	1.85c to 2.00c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.40c to 2.50c
Plain wire, Pittsburgh	2.25c
Galvanized wire, Pittsburgh	2.75c
Barbed wire, painted, Pitts.	2.50c to 2.65c
Barbed wire, galv., Pittsburgh	3.05c to 3.15c
Polished staples, Pittsburgh	2.55c to 2.65c
Galvanized staples, Pittsburgh	3.05c to 3.15c
C't'd nails, per count keg, Pitts.	1.90c to 2.00c

Chain, Piling, Strip Steel

Chain, ½ in. proof coil, Pitts.	5.50c
Sheet piling base, Pittsburgh	1.65c to 1.80c
Hot rolled strip steel, Pittsburgh stamping quality	2.25c to 2.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	3.75c to 4.00c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.15c to 3.50c
No. 28, bessemer, Pittsburgh	3.15c to 3.50c
No. 28, open-hearth, Phil.	3.51c to 3.66c
No. 28, open-hearth, Chicago	3.53c to 3.68c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.15c
No. 28, open-hearth, Chicago	3.38c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.15c to 4.50c
No. 28, bessemer, Pittsburgh	4.15c to 4.50c
No. 28, open-hearth, Phila.	4.51c to 4.66c
No. 28, open-hearth, Chicago	4.53c to 4.68c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.40c to 2.75c
No. 19, bessemer, Pittsburgh	2.40c to 2.75c
No. 10, open-hearth, Phila.	2.76c to 3.01c
No. 10, open-hearth, Chicago	2.78c to 2.88c

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	71	58½
1 to 1½-inch, butt iron	44½	29½

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c. l.	53 off
Charcoal iron, 3½ to 4½ inches, l. c. l.	28 off
Seamless, 3¼ to 5-inch, l. c. l.	43 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	$49.10
Six-inch and over, Chicago	45.10
Four-inch, New York	51.80
Six-inch and over, New York	48.80 to 49.80
Four-inch, Birmingham	39.50 to 40.50
Six-inch and over, Birmingham	35.00 to 35.50
Three-inch, Birmingham	48.50 to 49.50

Class A pipe is $4 higher than Class B
Standard fittings, Birmingham, base, $100.00
6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, one month ago, three months ago and one year ago

	May 31, 1922	April 1922	Feb. 1922	May 1921
PIG IRON				
Bessemer, valley, del., Pittsburgh.	$26.96	$22.46	$21.31	$26.06
Basic, valley, del., Pittsburgh....	26.96	22.21	19.81	23.96
No. 2 foundry, del., Pittsburgh..	25.96	22.31	20.96	25.56
No. 2 foundry, Chicago.....	23.00	20.50	18.90	22.90
Lake Superior charcoal, Chicago.	29.00	26.50	30.50	38.50
Malleable valley	25.00	20.25	19.00	24.10
Malleable, Chicago	23.00	20.50	18.90	23.40
*Southern No. 2, Birmingham....	18.00	16.00	15.35	22.50
*Southern Ohio, No. 2 Ironton..	23.00	20.30	19.25	24.50
Basic eastern del., eastern Pa.....	25.00	21.70	19.84	25.00
**No. 2X, Virginia furnace.....	23.50	22.85	22.00	27.00
**No. 2X, eastern del. Phila....	25.84	23.75	21.35	26.10
Gray forge val. del., Pittsburgh..	25.96	21.96	20.96	24.81
Ferromanganese, del., Pittsburgh.	72.82	69.07	65.32	83.00
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh.	35.00	31.50	29.00	39.00
Sheet bars, open-hearth, Pittsburgh	35.00	31.50	29.00	39.00
Billets, bessemer, Pittsburgh....	35.00	30.10	28.00	37.00
Billets, open-hearth, Pittsburgh...	35.00	30.10	28.00	37.00
FINISHED MATERIAL—				
Steel bars, Pittsburgh	1.60	1.50	1.40	2.10
Steel bars, Chicago.....	1.70	1.60	1.52	2.48
Steel bars, Philadelphia	1.96	1.91	1.76	2.40

*1.75 to 2.25 silicon

	May 31, 1922	April 1922	Feb. 1922	May 1921
FINISHED MATERIAL Continued				
Iron bars, Philadelphia.....	$1.96	$1.91	$1.76	$2.35
Iron bars, Chicago mill.....	1.70	1.63	1.60	2.45
Beams, Pittsburgh	1.60	1.50	1.40	2.20
Beams, Philadelphia	1.96	1.91	1.76	2.55
Beams, Chicago	1.70	1.60	1.52	2.58
Tank plates, Pittsburgh	1.60	1.50	1.40	2.20
Tank plates, Chicago.....	1.70	1.63	1.52	2.58
Tank plates, Philadelphia.....	1.96	1.91	1.76	2.55
Sheets, blk., No. 28, Pittsburgh..	3.15	3.10	3.00	4.00
Sheets, blue anl., No. 10, Pitts.	2.40	2.35	2.25	3.10
Sheets, galv., No. 28, Pittsburgh..	4.15	4.10	4.00	5.00
Wire nails, P'ttsburgh.....	2.40	2.40	2.45	3.10
COKE—				
Connellsville furnace, ovens.....	6.50	4.30	2.95	3.25
Connellsville foundry, ovens.....	7.00	4.95	3.80	4.85
OLD MATERIAL—				
Heavy melting steel, Pittsburgh..	17.50	16.35	13.95	13.60
Heavy melting steel, eastern Pa..	15.50	14.35	12.25	11.80
Heavy melting steel, Chicago....	14.25	13.50	11.10	11.50
No. 1 wrought, eastern Pa.....	17.25	15.85	15.50	15.25
No. 1 wrought, Chicago.....	13.75	13.25	11.60	11.90
Rerolling rails, Chicago.....	15.50	14.25	11.50	13.25

**2.25 to 2.75 silicon

Orders for Iron in Less Total

Consumers More Deliberate in Making Additional Purchases but Call For Heavy Shipments—Philadelphia Reports Sale of 25,000 Tons—Some Steelmaking Tonnage Sold—More Negotiations for British Iron

Philadelphia, May 29.—At least 25,000 tons of pig iron was sold in this district during the past week and as a result of this business another producer has withdrawn from the market temporarily. Now only three eastern Pennsylvania and New Jersey interests are in the market and none are anxious sellers. One maker which was on a $23.50 basis now is asking $24.50 furnace for No. 2 plain, (1.75 to 2.25 silicon) with 50 cents differential for No. 2X (2.25 to 2.75 silicon) and another $1 for No. 1X (2.75 to 3.25 silicon). The market now is $24 to $24.50, base furnace, or $24 to $24.50 for No. 2 plain, $25 for No. 2X and $26 to $26.50 for No. 1X. However, sales have been made at $25 for No. 2 plain, $26 for No. 2X and $28 for No. 1X. An eastern steelmaker the past week bought several thousand tons of basic, the tonnage being distributed to three furnaces. This business went at $25 to $25.50 delivered, which range now represents the market. Low phosphorous was lacking in business during the past week but several lots are under negotiation and prices are unchanged at $30 furnace for the copper bearing quality and $30 to $32 for copper free. The inquiry for 1000 tons of gray forge mentioned last week has been withdrawn.

It has been learned that no unsold stocks of low phosphorous are on hand at any furnaces so that all sales made from now on will call for production. The Robesonia furnace is expected to blow in on low phosphorous about June 15, and the Chester, Pa., furnace is expected to blow in on this grade in August. Several carloads of Virginia foundry was sold in this district during the past week at $23.50 furnace for No. 2X in some cases. There is considerable interest in this district in offerings of foreign foundry iron and it is reported that several lots are under negotiation. Current prices range on a basis of $24 to $25 tidewater for No. 3 foundry, Middlesbrough.

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Chicago Market Quiet

Chicago, May 29.—The Chicago pig iron market is quiet. The price continues strong at $23 base and buyers accept this figure for current needs. A lot of 1000 tons of foundry iron for the third quarter was divided in the week among the three makers. 250 tons of malleable was sold in the Milwaukee district. Lots of 200 and 400 tons were sold in Chicago. Agricultural implement makers give indications of buying small tonnages. Some inquiry is being received for charcoal iron, the price of which is firm at $29, Chicago. The market for silveries is quiet, and prices are unchanged. One of the Bayview furnaces of the Illinois Steel Co., Milwaukee will be blown in this week. Zenith furnace at Duluth probably will be blown in July 1.

Inquiries and Sales Absent

Pittsburgh, May 29.—Quiet periods have succeeded each other in the pig iron market for the past 18 months, but the present one exceeds anything before encountered in the Pittsburgh district. The sellers state that for several days, the market has been devoid of both inquiry and sales. Producers find they are behind on orders since shipments have fallen off. Several buyers are endeavoring to have makers increase shipments on contracts made last March and April. Numerous

consumer stocks are dwindling and some are getting near the danger point. As it is, however, both contract and spot buyers are holding off as long as possible hoping that prices shortly will reflect the decline in freight rates, a possible lower cost of ore, or something of that character. In answer producers state, taking into account all these possible reductions in cost, basic and bessemer pig iron will not be made on a profitable basis at figures much below those now prevailing. These remain unchanged at $25 valley for basic, bessemer and malleable. A lot of 1000 tons of resale bessemer was offered to middlemen the past week at $24.50 valley, but no buying interest developed.

Foundry iron still is quotable at $24 to $25 valley for No. 2 (1.75 to 2.25 silicon.) Inquiries on this grade too have been smaller and only a few involving 200 or 300 tons have come up. While low phosphorus, copper-free iron has been sold at as high as $34.50 valley from $33 to $34 is considered the quotable market.

Buying Starts to Pick Up

Boston, May 29.—While the production in jobbing foundries is still low, pig iron buying shows some improvement after the dull period a week ago and an increasing number of foundries appear to be on the point of entering the market for third and fourth quarter iron. Prices in nearly all districts are firmer. The price of $24 eastern Pennsylvania apparently has disappeared from the New England market and recent sales from this producing district have been at $25, furnace for No. 2X, 2.25 to 2.75 silicon, or $29.06 delivered. The reduction in freight rates is expected to delay some orders for fourth quarter delivery until the cut is in effect. Nevertheless inquiry at present is heavy. An eastern Massachusetts machine manufacturer is asking 1500 tons in three lots of 500 tons each, one of No. 2X, one of No. 1X (2.75 to 3.25 silicon) and the third of 3.25 to 4.00 silicon. A Massachusetts electrical manufacturer wants 250 tons. A Connecticut foundry asks 200 tons of malleable and a New Hampshire foundry, 300 tons of malleable. In addition, scattered foundries throughout the district are in the market for carload lots or small tonnages. Sales during the week include two lots of southern iron aggregating 600 tons; 300 tons of eastern Pennsylvania iron to a Connecticut consumer; a 600-ton lot to a Massachusetts consumer and 100 tons to a New Hampshire consumer. In addition, carload sales aggregating approximately 600 tons have been reported as well as other scattered lots. The low seller in the Buffalo district has marked its price up to $23 base furnace or $28.46 delivered. No. 2X is offered at $23.50 furnace or $28.96 delivered and No. 1X at $24.00 furnace or $29.46 delivered.

Buying is More Scattered

New York, May 29.—While pig iron buying continues of fair proportions it is of a more scattered character, and consumers generally are not as much interested as a few weeks ago. As a result of the recent sustained buying, however, furnaces are well provided with business. In fact, two eastern

Extended statistics of American and European iron and steel production, exports, imports, freight rates, etc., pages 1612, 1613 and 1614

Pennsylvania makers which booked large tonnages lately, now are practically out of the market. Prices are showing an advancing tendency. One eastern furnace, which was selling at $23.50, base furnace, yesterday advanced to $24.50, base. The current market on eastern Pennsylvania and New Jersey foundry iron is $24 to $24.50, furnace, for 1.75 to 2.25 silicon, $25 for 2.25 to 2.75 silicon and $26 to $27 for 2.75 to 3.25 silicon. As a matter of fact, sales of substantial tonnages have been made at $25, furnace, for 1.75 to 2.25 silicon, and at $28 for 2.75 to 3.25. A Buffalo maker has resumed quoting on the $23 basis and now is quoting $23, furnace, for 1.75 to 2.25 silicon; $23.50 for 2.25 to 2.75 and $24 for 2.75 to 3.25. In some cases, Buffalo iron continues obtainable, however, at 50 cents to $1 below this level. Some Buffalo malleable has been sold at $22, Buffalo. It is learned that a Phillipsburg, N. J., pipemaker which last week was reported to have bought 6500 tons of foundry, actually placed 8000 tons. The usual price on Central Pennsylvania foundry is $24, base furnace.

Fair Sales At Buffalo

Buffalo, May 29.——Sales of pig iron the past week have been 10,000 to 12,000 tons of all grades. One producer sold 5500 tons out of 7500 tons of inquiry and another sold 3000 tons. Miscellaneous bookings reached 2500 to 3000 tons. Orders were not placed for many large tonnages but the volume of smaller inquiries indicates a more general interest. Prices for 1.75 to 2.25 silicon foundry iron are from $22.50 to $23 with a trend towards $23. The silicon differential is 50 cents extra for each of the two higher grades making a spread of $23.50 to $24 on the No. 1X (2.75 to 3.25 silicon). The basic price is firm at $23. The lower priced iron now being marketed is from makers who declined to participate in the market when it reached its low of $18 a few months ago. Twelve stacks are in blast in the district.

Sell More Basic

Cleveland, May 29.—Prices of pig iron quoted by the northern Ohio group of furnaces remain firm at $23 to $24, base, for outside delivery, and $24 for shipment in Cleveland. The demand for foundry iron is limited entirely to small lots; the aggregate of the tonnage booked holding up well to that of recent weeks. A scarcity of foundry grades prevails in some directions, and one of the leading merchant interests is out of the market temporarily. Another maker booked 9000 tons of iron in the week, slightly more than in the week preceding, made up of 100 to 500-ton lots. Some business is expected to result from the fact that the Ford Motor Co has notified foundries making castings for it that they will be unable to ship iron from its blast furnaces to those foundries in June, July and August. This will compel certain foundries to obtain iron in the open market. More activity is noted in basic. Confirmation has been obtained of a recent resale of 5000 tons to a valley sheet and tin plate manufacturer at $25 valley and this same buyer is reported to have purchased 10,000 tons from another source. The Upson-Nut Co., Cleveland, was the purchaser of 5000 tons reported a week ago as having been booked at $25, Cleveland furnace and this consumer has been seeking 5000 tons additional. The Andrews Steel Co.'s inquiry for 5000 tons is understood to have been satisfied and it is reported that several thousand tons more than this amount was taken.

May Sales Are Heavy

Cincinnati, May 29.—One southern Ohio furnace is reported to be offering No. 2 foundry iron at $22.50, Ironton base, for prompt delivery, but recent sales have been at a uniformly higher range and the market today is quoted at $23 to $24. Buying has been moderately active and the month closes with a record surpassing that of any previous similar period this year. A considerable tonnage was taken late last week by Hamilton melters from southern Ohio furnaces, one consumer buying 300 tons of foundry, another a like tonnage and a third, who had not been in the market for some time, placed 200 tons. The Newport Rolling Mill Co. closed for part of the tonnage on which it had inquired, placing two orders for 300 tons each. Another local melter bought 200 tons. A Cincinnati representative of southern furnaces booked orders for three lots, 1,000, 500 and 300 tons respectively for shipment over the last half to western foundry melters, the price ranging from $18.50 to $19, Birmingham. A Central Ohio manufacturer bought 150 tons of southern and 150 tons of northern foundry for June delivery. Southern standard foundry iron still is available at least from two furnaces at $18 but current sales at higher prices predominate and the market is quoted at $18 to $19 base, Birmingham.

Buying Is Less Pronounced

St. Louis, May 29.—Interest in pig iron continues active, with prices strong and melters eager to get in their tonnages, but the buying movement has temporarily subsided. The lull in a measure is due to the fact that users have provided against their immediate requirements and are satisfied to await further developments before engaging anything more. Another factor is the sold-up condition of many important furnace interests, especially in the South. These interests have disposed of their outputs to the end of the third quarter, and at present have nothing to offer, in spite of increased production. Some fair inquiries and a few scattered sales have been made for fourth quarter delivery. For the most part, however, neither producers nor consumers appear anxious to deal that far ahead. Sales have been chiefly in small lots. Jobbing foundries and a number of specialty makers find they underestimated their requirements, and are seeking spot tonnages. There continues a disposition to anticipate shipments on contract. Spot iron is growing increasingly scarce, with assortments

limited. Sales of southern iron aggregating approximately 1500 tons were reported, virtually all of which went at $18.50, Birmingham. A small tonnage, between 300 and 400 tons was reported sold at $18, but this was a lot held by a broker. Northern iron remains unchanged at $23 base, and the leading local producer continues to quote $24.50, f.o.b. Granite City. While the volume of orders with iron consumers is not as large as during April and the first week of May, there is still a satisfactory demand for all varieties of finished and semifinished goods.

Southern Quotations Are Stronger

Birmingham, Ala., May 29.—Pig iron quotations in the Birmingham district are working up to a $19 level for No. 2 foundry (1.75 to 2.25 silicon).

A little tonnage has been sold by furnace interests here at that price for delivery during the third and fourth quarters. Selling for the last quarter, however, has not been started with any degree of strength. Furnace interests have not a large amount of probable output for the third quarter unsold but an increase in production is in sight and this will help the situation. Sales during the past week have been for shipment in almost every direction. New England sales are amounting to quite a tonnage. Shipments through the Ohio river gateway, to the St. Louis and Chicago territory and to the Far West are increasing in volume steadily. The local melt is increasing and both the high pressure and soil pipe plants continue to produce on a big scale. Furnace interests here believe that the railroad freight reduction of 10 per cent July 1 will be of benefit. The Sloss-Sheffield Steel & Iron Co. will blow in two blast furnaces in the next ten days, making five out of seven stacks in operation. Basic as well as foundry iron is being shipped from this district in quantity. Less than 35,000 tons of iron it is estimated is on the yards in this district.

Chicago Is Unchanged

Chicago, May 29.—Steel mill operations at Chicago are unchanged, the Illinois Steel Co. continuing at 85 to 86 per cent of capacity, and Inland Steel Co. at 70 per cent of capacity. The only variation from these figures comes in occasional changes from heavy to light sections on the rolling schedule. No probability of adding further blast furnace capacity is now seen, the fuel situation governing. Other mills are also pursuing an even course. When a sufficient fuel supply becomes assured, mills can easily go to full production on the basis of present orders.

Will Build New Plant

Erection of a modern factory building on a 7½-acre site at Cooper avenue and the Long Island railroad, Glendale, Long Island, N. Y., is planned by the V. & O. Press Co., Brooklyn, N. Y., manufacturer of presses, dies, etc. The company recently purchased additional machine shop equipment. The new plan is necessitated through the expansion in the demand for the company's presses and sheet metal working machinery.

Coke Continues Advance

More Furnaces Seeking Tonnages—Minimum Is Now $6.50—Consumers in Distress Offer $7.25—Foundry Contracts Booked at $6.25

COKE PRICES, PAGE 1522

Pittsburgh, May 29.—More buyers are negotiating for beehive coke with which to start blast furnaces. The Trumbull-Cliffs Furnace Co. and the Struthers Furnace Co., have not proceeded far with their efforts to obtain tonnages, although it is understood the latter has assurances of a source of supply should the coal strike end soon. It plans to blow in its furnace June 10 or 15 to make foundry iron. The Sharon Steel Hoop Co. has entered the market for 12,000 tons monthly for three months and the Pittsburgh Steel Co. is endeavoring to purchase coke requirements for its Monessen, Pa. furnace which has been banked for several weeks. The last sizable sales were on the basis of $6 to $6.50, ovens, but since that time as high as $7 has been paid for a few cars at a time and it is apparent that coke cannot be had for less than $6.50 today, producers indicating that figure as the lowest they will accept. The market is quotable at $6.50 to $7. Serious straits of some users are indicated by their offers to buy at $7.25. Some holders of small blocks of furnace coke representing production in excess of contract obligations are asking $7.50. Using these factors as the basis for quotations, the furnace coke market is quotable at $7 to $7.50, the same as foundry. Prospective purchasers of large amounts of the furnace grade note that production is greatly curtailed. While the coke output has been increased since the sixth week of the coal strike, this has been due to activity at the ovens of the H. C. Frick Coke Co. Some furnace coke sellers are talking of a sliding scale of about 5 to 1 for the last half, using the price of basic iron as the basis. With basic iron at $25, this would create a $5 price for furnace coke, but in view of the uncertainty surrounding pig iron and coke in the last half, most operators are averse to committing themselves to longer periods than three months. Intermittent demand for foundry coke continues to be noted and one company here has taken one or two last half contracts at $5.25, although the spot market cannot be quoted today at below $7 to $7.50. Some other contracts have been booked at $6.25, and $6 generally is talked of as the possible figure for last half business when the coal strike is settled. Production according to the *Connellsville Courier* for the week ended May 20 was 57,430 tons as compared with 54,150 tons the preceding week.

Coke Prices Firmer

Boston, May 29.—Despite the dullness among jobbing foundries demand for foundry coke has increased, due probably to the expected advance in prices of contract coke June 1. Connellsville coke still is firm, and is quoted in this market approximately $2 above the by-product figure. Demand from points outside New England for the local by-product fuel continues to improve.

Contract For Foundry Grade

New York, May 29.—Contracting for foundry coke for the second half has assumed considerable proportions. A large tonnage has been placed in this district on the basis of $5.25, Connellsville, for beehive coke. Buying of spot and nearby foundry coke has been fair. This business has been done at prices ranging from $6.50 to $7 Connellsville. The northern New Jersey by-product coke producer continues to quote $9, f.o.b. ovens, equivalent to $9.84 to $11.24 delivered at Newark.

Transactions Limited

Cincinnati, May 29.—A number of tentative inquiries are current for beehive coke but actual transactions are limited.. Prices are steady. Some northern consumers are buying Alabama coke and others are negotiating. Indianapolis by-product producers will advance their price $1, effective Thursday.

Shipments Slowing Up

St. Louis, May 29.—Coke shipments from the East are coming through slowly, and a number of important ovens which sell in this district have withdrawn from the market. Supplies of leading consumers are holding up well, and in a number of instances drafts on reserve piles are being replaced in whole or part by new purchases. Local by-product interests report that steam users have been negotiating with a view to substituting small coke sizes for screenings, the latter being scarce and advancing in price. Tonnages have been shipped to local plants for the experiment. Coal prices continue to advance, but no evidence of scarcity has appeared. Stocks of unconsigned coal in the Illinois field adjacent to St. Louis are being reduced.

Southern Prices Advanced

Birmingham, Ala., May 29.—Coke prices in the Birmingham district have been increased, the by-product foundry grade now selling as high as $5.50 to $6. Furnace coke is quoted $4 to $5. Pitch coke is reported selling at $9 and $10. The Alabama Co. is putting into operation the balance of its beehive ovens at Brookwood, in Tuscaloosa county. Independent coke producers are booked up fairly well for some time, and prospects are bright for further business.

Contract For Foundry Coke

Philadelphia, May 29.—A good business is being done in this district in second half foundry coke at $5.25 Connellsville. For prompt delivery foundry coke prices continue at $6.25 to $6.50, Connellsville. Some by-product coke from Swedeland operations is being sold on a basis of monthly requirements at $6, Connellsville.

Bars Are in Heavy Demand

Producers Book Tonnage in Excess of Production and Shipments—Price Minimum Advancing—Iron Bar Bookings Heaviest in Two Years

BAR PRICES, PAGE 1522

Chicago, May 29.—Inquiry for soft steel bars and sales are unusually good, while specifications are being filed against existing contracts in large volume. Definite figures as to bookings over the past few weeks are surprising and indicate the need felt by consumers for additional material. All producers have been booking tonnage much in excess of production and shipments and deliveries are now at a point where further selling is being done cautiously to avoid obligating mills into fourth quarter. Practically no contracting is being done and present sales are for immediate specification. Bars still are quoted at 1.70c, Chicago, but it is believed this figure will be advanced shortly, as conditions indicate a higher figure should be obtained. Bar iron is strong at 1.70c to 1.75c, Chicago mill, and the past week has been the best in at least two years. Most of the tonnage has been placed by railroads who are turning again to this product after using steel to some extent. Orders from several roads brought about the unusually large tonnage of last week. Some mills are operating double turn to keep up with demand.

A feature of the hard bar market is the announcement that the rerolling mill of the Republic Iron & Steel Co. at Moline will be placed in service July 5, after having been idle for 17 months. This mill furnishes most of its production to agricultural implement builders and its idleness has been a result of conditions in that industry. At present the market for hard bars remains steady at 1.65c, Chicago mill.

Hampered By Coal Strike

Pittsburgh, May 29.—Lack of ease to make deliveries of merchant steel bars, hampered as producers are by the coal strike, is working a hardship upon many buyers. The situation fast is reverting to the pre-war situation where deliveries of certain sizes of bars were deferred from two to three months. Orders are placed at prices from 1.50c to 1.75c, base Pittsburgh, the usual prices being 1.60c and 1.70c. Requests to hurry shipments forward are received and mills find it difficult to convince the purchasers that everything possible is being done to expedite deliveries. Inquiries are particularly numerous and both small and large quantities are involved. A few orders lately have comprised 1000 tons each. Demand for refined iron bars is improving somewhat although not comparable to the improvement in steel bars. Prices on refined iron are unchanged.

Market Nears 1.70c Minimum

New York, May 29.—The steel bar market rapidly is crystallizing at a minimum price basis of 1.70c, Pittsburgh. Numerous lots involving carloads and more have been sold at this figure. On large sized lots, 1.60c base Pittsburgh probably still could be done, but there is a lack of such large lots. However, the current business comprises a large total in the aggregate.

Inquiry is Strong

Buffalo, May 29.—Inquiry for steel bars is strong but few makers will accept tonnage freely. The price is 1.60c to 1.70c, Pittsburgh, and contracts are being made at the convenience of mill schedules.

Nut Steel in Demand

Cleveland, May 29.—Small rounds, especially the nut and bolt sizes are in great demand and deliveries on these have fallen as far back as September and October. Forging rounds also are much sought and shipments now are a matter of several months. Generally the steel bar market is strong with consumers in this district ordering freely. Some makers as are able to offer certain sizes for early shipment continues to accept business at 1.60c which is the minimum of the market. Other mills are quoting up to 1.70c.

Buying Is Active

Philadelphia, May 29.—Active buying continues to feature the steel bar market. Both consumers and jobbers are buying consistently, and in fact, bars are the most active of the finished products. With most independents the minimum price is 1.70c, base Pittsburgh. However, in some cases independents and the leading interests continue to quote 1.60c to regular customers. Numerous inquiries are out for third quarter bars but mills generally refuse to quote that far ahead. In addition to steel bars demand for concrete bars is also good and considerable interest in one lot of 800 tons for Norfolk was shown. The current market for concrete bars for mill shipment ranges from 1.60c to 1.70c, base Pittsburgh, with the latter price the usual minimum for early shipment. A large tonnage of concrete bars is involved in the Delaware river piers on which bids will be opened May 31. The first contract recently was placed for a couple hundred tons of concrete bars for the Hotel Sylvania, this city. Spring steel is in good demand the price being 1.70c plus 25 cents extra. Demand for forging bars is also good the usual price being 1.70c, Pittsburgh, plus 25 cents extra.

Cold-Drawn Conditions Stronger

Pittsburgh, May 29.—Conditions have changed materially in connection with cold-drawn steel bars. Not many weeks ago mills were hungry for business and now the inclination is to name high quotations on inquiries in order to discourage buying. Most makers have good backlogs of business and do not desire to increase bookings until they know something about what their costs are going to be in the third quarter. As it is, the market is strong at a minimum of 2.00c, base Pittsburgh, with some makers quoting as high as 2.25c, or $5 per ton higher for the purposes outlined. Bookings doubtless would be heavier with service to customers better, if deliveries of hot bars from the steel mills were more attractive. Demands are sizable from practically every consuming line, even the machine tool industry sharing in the betterment.

Bolt, Nut, Rivet Buying Continues Spirited

NUT AND BOLT PRICES, PAGE 1606

Chicago, May 29.—While most selling of bolts and nuts consists of small tonnages a large order is occasionally received. Recent business has included a single order in excess of 1,000,000 pieces. It is expected this sort of buying will become more common as business progresses. Recently announced discounts are holding steadily.

Tonnages Are Larger

Cleveland, May 29.—Betterment in demand continues to be reported by makers of bolts and nuts in this district. Tonnages are larger and more carlot business is being placed. The railroads appear to be the largest buyers but considerable business is being placed by industry in general principally the automotive and jobbing trades. These orders are being taken at the price level established several weeks back.

Tonnages are larger and demand continues to reflect the general betterment in business, rivet makers here report. During the week the leading maker reports booking two 100-ton rivet orders from two western railroads. The automotive industry, boiler makers, the railroads and the jobbing trade are furnishing the bulk of business, which is going at the quoted levels.

Higher Prices To Come

Pittsburgh, May 29.—Predictions of even higher prices upon nuts, bolts and rivets are freely made as production costs continue to rise. Contributing largely to this is the present high cost of fuel. Makers state the recently lowered discounts which increased the price on nuts and bolts approximately 10 per cent, are being firmly adhered to and a fair amount of business is being booked. Orders from a carload to 200 tons at a time are noted. Operations continue approximately unchanged, some plants averaging 70 or 80 per cent and one or two running practically full.

Shading Is Reported

Philadelphia, May 29.—While 65 and 5 off on large sized bolts is the usually observed discount, with other bolt and nut prices on this basis, instances of shading on attractive orders have developed during the past week. However, these are exceptional. Demand is somewhat quiet.

Hoop Prices Are Firm

HOOP PRICES, PAGE 1522

Pittsburgh, May 29.—Hoops are firmer at the higher levels introduced recently, 2.25c, base Pittsburgh, with

certain sizes and gages quoted at 2.50c. The advance of $5 per ton to that minimum took some makers out of the market automatically. Makers today are indifferent about adding to contract obligations and buyers have not accepted to the increase to any measurable extent as yet. Bookings since the increase have been few. Shipments continue heavy on old contracts made earlier in the year at the lower levels.

Ask for Rate Cut

On Upper Lake Ore Shipments—Prices Still Unsettled

ORE PRICES, PAGE 1606

Cleveland, May 29.—An important meeting is scheduled to be held in Chicago on Wednesday of this week when Lake Superior iron ore shippers will ask the executives of the upper lake railroads to put in effect a 10 per cent reduction in rates from mines to upper lake ports. This will be entirely independent of the shippers' case now pending before the interstate commerce commission for a greater reduction. In view of the commission's failure to reduce the upper lake rates the shippers are left entirely at the mercy of the railroad executives. They will be asked to put a 10 per cent reduction in effect immediately, letting the Adriatic case take its course. The argument is that such a reduction will stimulate shipments, while if no reduction is made the tendency will be to hold back on shipments until after the reduction in ex-lake rates goes in effect.

Ore shippers also will be represented in Washington Thursday when a meeting will be held with executives of the eastern railroads. It appears now that the executives will be favorably inclined to a request to put in effect on one day's notice the new tariffs reducing rates 10 per cent.

Pending developments at these meetings ore prices have not been determined.

The Lake Superior Iron Ore association gives the following statistics with respect to ore consumption:

	Tons
Ore consumed in March	3,067,451
Ore consumed in April	3,058,929
Decrease in April	8,522
Ore consumed in April, 1921	1,674,623
On hand at furnaces May 1	18,102,682
On Lake Erie docks May 1	6,988,878
At furnaces and Lake Erie docks May 1	25,091,560
At furnaces and Lake Erie docks May 1, 1921	27,595,477

Gets Post Under Hoover

Paul John Kruesi of Chattanooga, has been appointed acting assistant secretary of the department of commerce while C. H. Huston is abroad. Mr. Kruesi is vice president of the East Tennessee Iron & Coal Co., president of the Chattanooga Electric Metals Co., and of the Southern Ferro-Alloys Co., besides having other industrial and business connections in the South.

The Gardner Iron & Metal Co., Gardner, Mass., has petitioned the superior court for a dissolution of the corporation.

Plate Tonnage Holds Up

Good Tonnages Continue To Come Out for Great Lakes Vessel Construction—Buyers Find It Difficult To Obtain Early Shipment

PLATE PRICES, PAGE 1522

Cleveland, May 29.—Vessel construction on the Great Lakes continues to present a demand for a good plate tonnage. Another 600-foot freighter for the Tomlinson interests, has been placed with the American Shipbuilding Co. and the 4000 tons of steel will be supplied by the Carnegie Steel Co. Two other bulk freighters are under active negotiation, and a decision on the two large passenger vessels requiring 5500 tons each which has been before lake producers for some months, is believed to be near at hand. An inquiry is pending for 2000 tons of steel for the new blast furnace project at Port Henry, N. Y., recently announced. The delivery factor is having more weight in prices. Some lots, particularly boiler steel for shipment within a few weeks are being closed at 1.75c to 1.85c Pittsburgh. On the light gages up to 2.00c base is being obtained under the sheet schedule. On ordinary tank steel 1.60c still is quoted by several large producers while certain others now are asking 1.70c.

Mills Are Crowded

Pittsburgh, May 29.—Plate orders booked in March and April were so heavy that buyers this month are having difficulty to obtain desirable shipments. Orders, varying considerably in size, are being booked for delivery at mills' convenience, but within two weeks after the placing, buyers endeavor to hurry shipments. Inquiries are numerous, involving 50 to 5000 tons. One of the latter size for railroad car ends includes some shapes. Fabricators are figuring on numerous small tank jobs involving 200 or 300 tons of plates each. Some slightly larger ones were awarded recently. One eastern pipe company would purchase six or seven 55,000-barrel tanks if immediate delivery could be made. This would involve 1200 or 1500 tons of plates. Plates are quoted from 1.50c to 2.00c, base Pittsburgh, but the usual and more representative spread is 1.60c to 1.70c. The 1.50c figure is the Carnegie Steel Co.'s price to large customers, but the maker is obtaining 1.60c on certain orders. The 1.70c price is the usual figure of independents in this territory and 1.75c is being obtained on unattractive business. Higher prices are quoted by some Ohio producers.

Business in Small Lots

Philadelphia, May 29.—Plate demand is comprised almost entirely of small and moderate sized tonnages which form a fair total. Few large tonnages are pending here. An increasing proportion of current business is going at 1.70c base Pittsburgh, though 1.60c continues to be done on attractive tonnages. Orders for tank plates ranging from carloads to several hundred tons have been placed at 1.75c and even 2.00c, base Pittsburgh. Some inquiry is current for third quarter shipment but most mills refuse to quote. Several tonnages have been sold for June, July and August at 1.70c, base Pittsburgh. The Seaboard Air Line is buying several hundred tons of plates weekly for car repairs. Considerable shape and bar tonnage is going to the Norfolk & Western and other roads.

Plates in Better Position

Chicago, May 29.—While most finished steel products cannot be bought now for delivery over much of third quarter, a little better position exists as to steel plates, which can be obtained from an independent mill in six to eight weeks. The present quotation for plates ranges from 1.70c to 1.80c, Chicago mill, the higher figure being quoted by an independent producer. No heavy demand for sheets is in the market at present, except for the additional cars being placed occasionally.

Steel & Tube To Expand; New Officers Named

Chicago, May 29.—The Steel & Tube Co. of America has elected Herbert H. Springford of the Goodyear Tire & Rubber Co., president succeeding Armin A. Schlesinger who becomes chairman of the executive committee. A. H. Beale has been made vice president in charge of operations and F. F. Corby general manager of sales, also has been made a vice president. C. F. Speth, assistant treasurer, was elected treasurer, also succeeding Mr. Schlesinger, and F. R. Wahl, assistant secretary, was made secretary succeeding C. D. Caldwell.

Mr. Springford has been special assistant to E. G. Wilmer, president of the Goodyear company who formerly was a vice president of the Steel & Tube Co. Mr. Springford had been treasurer of the Goodyear company, taking that office a year ago when the company was reorganized and Mr. Wilmer was made president. Mr. Springford, a native of England, gained his experience in the steel, tube, gas and mining business in Milwaukee. He formerly was assistant to the president and assistant treasurer of the Steel & Tube company.

At the meeting the company increased the directorate from 17 to 19 members and elected the following: Harrison Williams, chairman of the North American Co.; Leonard Kennedy and J. C. Brady of New York; H. H. Springford, Frank F. Corby, D. R. McLennan and W. M. L. Fiske of Chicago; and Charles F. Fawcett and George P. Miller of Milwaukee.

The Steel & Tube company also decided to go ahead with an expansion program and voted to offer present stockholders $6,000,000 in a new issue. Two additional butt weld furnces are to be built at Indiana Harbor, giving the company an additional capacity of approximately 100,000 tons of pipe annually.

Scrap Activity Is Waning

Some Grades in Demand and Moving but Generally Market Is Quieter—Prices in Several Items Have Weakened, Some Being Marked Down

SCRAP PRICES, PAGE 1610

Chicago, May 29.—Because of lessened demand, the scrap market is soft and somewhat lower. Added to lack of demand is much freer selling by dealers, who have been attracted by the higher prices which have prevailed for some time and who are willing to let go much of their accumulations. In spite of the somewhat lower level of quotations, the decline is not expected to go rapidly as dealers have made sales in the recent movement upon which they are yet to cover and some buying by consumers is awaited from time to time. Supply is excellent, and while the market is quiet, it is far from weak, except that quotations are receding somewhat from the peak.

Steel Scrap Weakens

Boston, May 29.—Demand for heavy melting steel from Pennsylvania has dropped off sharply recently and while this slump does not affect borings and turnings in this market, it has been reflected in the local prices for heavy melting steel. Borings and turnings at Pennsylvania consuming points have declined about 50 cents, yet local dealers still are sufficiently active on old orders to keep local prices firm. Trading in all grades of scrap is dull. No. 1 machinery has sold during the week at $18.50 delivered but individual tonnages have been low.

Buy Borings and Turnings

New York, May 29.—Due to efforts to conserve fuel, eastern blast furnaces continue to buy substantial tonnages of borings and turnings, although a scarcity of this scrap is developing rapidly, and another advance in price is likely to develop shortly. Heavy melting steel is also moving in good volume, with the Bethlehem Steel Co. still the largest buyer. Quotations are strong but along with prices on the other principal grades are unchanged. The downward revision in freight rates, scheduled for July 1, is being reflected in only a slight slowing up of business. Much of the buying is still for immediate consumption, so that the effect of the announcement is not great. Many of the buyers are stipulating a discount in equivalent to the proposed 10 per cent reduction in rates.

Total Volume Good

Philadelphia, May 29.—Although buying of scrap in this district in the past week has been of a scattered character, the total is good. Several steel works bought sizeable tonnages of steel and cast scrap. Blast furnaces bought considerable and there has been good buying of foundry scrap. The largest transaction was the purchase of 2000 tons of heavy melting steel at $15.50 delivered at a Delaware consumer. Prices are tending higher.

Makers Out Of Market

Pittsburgh, May 29.—Additional purchases last week of sizable quantities of heavy melting steel by an independent steel company here at $17.50 confirms that as the top of the quotable market. These purchases are estimated to aggregate between 10,000 and 20,000 tons, and again take the buyer out of the market for the time being. The Pittsburgh Steel Co. continues out as are many other consumers in this territory. The tone of the market is less strong than a week ago although this is not reflected greatly in prices. No. 1 cupola cast is down 50 cents to $18.50 to $19. The purchase of approximately 5000 tons of railroad malleable by a Vandergrift, Pa., consumer apparently covers current demands and this grade too, is quotable at 50 cents below the recent level of $16.50 to $17. Compressed sheets has declined 25 cents to $15.25 to $15.75.

One explanation of the deferred entry of the Carnegie Steel Co. into the open market is its recent movement of 10,000 tons by barge via Ohio river from Mingo Junction and Steubenville, O. Railroad lists include the Pennsylvania eastern region, with 32,930 tons, which includes 13,000 tons of rails, 3350 tons

(*Continued on Page* 1543)

Sheet Bars Gain Strength

Round Tonnage Sold at $36, Youngstown, for Early Delivery—Conversion Mills Unable To Get Semifinished Material

SEMIFINISHED STEEL PRICES, PAGE 1522

Pittsburgh, May 29.—Conversion mills are finding it difficult to book their requirements of semifinished materials. In many cases these are greatly needed, particularly sheet bars, wire rods, and skelp. Finishing mills are holding for their own use, everything of this character they produce, being uncertain as to operations. Practically all of the conversion mills referred to would purchase material, although not many formal inquiries are out. Sheet bar users continue to inquire, and several consumers of rerolling billets are seeking lots up to 2500 tons. No interest is noted in slabs. The price on sheet bars, rerolling billets and slabs probably would be $35, Pittsburgh, in any transaction consummated.

Forging billets command a price depending upon the location of the buyer. As high as $40, Pittsburgh, has been obtained for several lots up to 200 tons each in this territory recently and that price again applied in the past week on a small lot.

Wire rods are quoted nominally at $38 to $40 although possibly $43 would have to be paid if some of the mills would sell. Skelp is quoted at 1.60c to 1.75c, base Pittsburgh, with no movement.

Eastern Prices Stronger

New York, May 29.—A number of moderate sized lots of semifinished steel have been sold in this district. Some of this business early last week was done on a basis of $33.50, base Pittsburgh, for open-hearth rerolling billets. However, the minimum now is $35. Forging billets were sold early in the week at $37.50 and $38 but it is not believed that these figures could be duplicated. The market on forging billets is believed now to be close to $40.

Wire Rod Sales Heavy

Philadelphia, May 29.—Several lots of billets were sold in the past week at prices which show the market here still is $33.50 to $35, base Pittsburgh, for rerolling billets, and $38.50 to $40 for the forging quality. Business in wire rods continues on a heavy scale. Most of the independents are quoting $40 base Pittsburgh as a minimum, but two independents as well as the leading interest still are taking care of their trade at $38. Included in semifinished business in this district is a good-sized tonnage of slabs.

Third Quarter Prices Uncertain

Youngstown, O., May 29.—The three makers of semifinished material here still are out of the market for all grades. Sheetmakers are beginning to anticipate their sheet bar requirements for the third quarter but have not been successful in obtaining prompt consideration from producers in view of the uncertainty regarding cost figures. From present indications sheet bar requirements for delivery after July 1 will be heavy. The price for third quarter business has not been maintained, although the trade has it that prices probably will range from $35 to $37.50, Youngstown. Slabs and billets are unobtainable.

Sheet Bars Sold at $36

Cleveland, May 29.—Sheet bars have been sold at a higher price, or $36, Youngstown, a sale of 1000 tons for early shipment having been made at this price to a consumer in that territory. The market is very strong at a minimum basis of $35, Youngstown or Pittsburgh. An inquiry for 7500 tons for third quarter has appeared but some makers are declining to quote that far ahead and have not attempted to take this business. A local producer, however, which is a prominent factor in the market at present, continues to book sheet bars and billets for delivery through the third quarter at $35 Youngstown or Pittsburgh and added a considerable tonnage to its bookings on this basis the past week. This producer now is understood to have a very large total of obligations on its books. A single sale of several thousand tons of sheet bars for delivery for this quarter at $35 was closed this week. Demand for billets is more pronounced and fair sales are being made.

Expect Advance In Semifinished

Chicago, May 29.—Plain billets are quoted at $34, Chicago mill, sheet bars

at $ and forging billets at $39, mill, that it is expected these figures will be advanced soon. Demand is excellent, and mills needing material for their own use are reluctant to sell, especially at the present level.

Warehouse Demand Is Large; Prices Hold

WAREHOUSE PRICES, PAGE 1606

Cleveland, May 29.—Warehouse interests here report orders in May were far in excess of those in April. Demand continues to improve steadily, with no one line in particular demand, all products appearing to share in the general betterment. Prices are unchanged but the leading sheet jobber here reports there is some talk of an advance shortly.

Prices Are Firm

Boston, May 29.—Demand for sheets and small structural shapes from warehouses has recently increased in an already active market. No. 28 black sheets have been marked up to 4.90c and No. 28 galvanized sheets to 5.90c, advances of 25 cents per 100 pounds in each case. Other warehouse prices are firm.

Demand is Increasing

New York, May 29.—Jobbers report an increasing demand for black sheets and automobile sheets, these items along with the structurals, appearing the most active at present. However, warehouse business is about in the same volume as last week, with prices steady.

Movement Is Improving

Philadelphia, May 29.—Jobbers in iron and steel materials in this district report the movement of iron and steel products out of stock is constantly improving and now represents 80 per cent of the record-breaking business of 1920. With the exception of cold-rolled rounds, prices are unchanged. Rounds are quoted 3.20c.

Strip Demand Is Active

STRIP PRICES, PAGE 1522

Pittsburgh, May 29.—Possibly the latter part of this week or the first of next, books of strip steel makers will be open for the third quarter. Higher prices are contemplated on cold-rolled although it is probable hot-rolled will remain somewhere around the maximum of the present market. Mills are filled up on hot-rolled until June 30, but if any small orders could be sandwiched into rolling schedules these probably would have to carry the 2.50c base price. The market is quotable at 2.25c to 2.50c, base Pittsburgh. The Trumbull Steel Co. has just announced a minimum of 2.40c. Mills in this district still can take on some business for June shipment in cold-rolled and continue to do this from week to week. The market price on cold-rolled is 3.75c, base Pittsburgh, with certain rollings bringing 4.00c. Orders are fairly sizable and numerous, attractive tonnages still being placed by the automotive industry. Other consuming lines too are taking their quotas.

All Sheets in Big Demand

Motor Car Makers Particularly Active in Market—Third Quarter Prices About To Be Named—Chicago Mill Raises Quotations

SHEET PRICES, PAGE 1522

Youngstown, O., May 29.—From present indications sheetmakers in this district will enter the third quarter with good orders for all grades of sheets. Producers are waiting for sheet bar figures, which in view of the present coal situation are difficult to obtain. A radical change in the price of sheet bars for next quarter generally is anticipated. Some consumers forecast a price of $33; others $35, while in one instance $37.50 is mentioned. Inquiry for all grades of sheets is holding up to that of last month, although the quotation of 3.15c, Pittsburgh, for black seldom is obtained. The general figure quoted on black at present is 3.40c, Pittsburgh. One makers' bookings at this and higher prices are heavy. Sheetmakers serving the automobile industry are oversold for this quarter and many will carry about four weeks' rolling into the third quarter. Consumers of all grades of sheets are anticipating their requirements for delivery next quarter and are pressing the mills for acceptance. An inquiry for 300 tons of 30-gage black sheets was current last week but the consumer is not meeting with much response. Prices are held firmly around 3.40c and 3.50c for black, 4.15c to 4.50c for galvanized and 2.40c to 2.75c for blue annealed, base, Pittsburgh. Some producers here are over sold on galvanized which was booked earlier in the quarter at bargain figures, and now are out of the market on this grade.

Orders are Increasing

New York, May 29.—Demand for sheets is improving in specifications on contracts and new business. The current market on black and galvanized sheets is 3.30c and 4.30c, base Pittsburgh, respectively. On blue annealed sheets the minimum is 2.40c, base Pittsburgh, while sometimes 2.50c is being done.

Eastern Prices Slightly Easier

Philadelphia, May 29.—Consumption of sheets is growing larger. Users are specifying heavily on contracts and new business also is increasing. The only department in which demand is lagging is among those consumers who market their products to the coal mines. Considerable demand is coming out for third quarter contracts but the mills are not ready to quote. In the meantime the price situation is slightly easier. On current business 2.40c to 2.50c, base Pittsburgh, is being done for blue annealed 3.15c to 3.30c for black and 4.15c to 4.30c for galvanized.

All Grades In Demand

Pittsburgh, May 29.—Practically all grades of sheets continue in heavy demand and users generally want to secure attractive positions on makers' order books. Some sizable orders for black and galvanized sheets again have been placed in the week, and round tonnages of blue annealed continue to be booked. Full-finished automobile in motor cars are ordered in fairly large quantities. Some medium priced automobiles are being produced in greater quantities than ever before. Operations of the American Sheet & Tin Plate Co. continue to average 90 per cent or higher and independents are operating at a better rate, the general average being 80 per cent capacity. The American company's prices have been 2.40c, 3.15c and 4.15c, base Pittsburgh, respectively, on blue annealed, black and galvanized. Some makers are quoting as high as 2.75c, 3.50c and 4.50c, respectively, though others still offer sheets at 2.65c, 3.40c and 4.40c.

Large producers are expected to announce prices for third quarter sheets in a few days.

Chicago Mill Advances Prices

Chicago, May 29.—An advance of $2 per ton on blue annealed and $3 per ton on black and galvanized sheets has been put into effect by the Inland Steel Co. The new schedule is 2.50c, Pittsburgh, on blue annealed, and 3.30c and 4.30c, Pittsburgh, on black and galvanized. Deliveries late in August still are available on some sizes. This producer is well sold far into the third quarter, but has not begun booking for fourth quarter. The leading interest has not advanced prices.

Tin Plate Bookings

For July Shipment Are Fairly Heavy; Plant Operations Steady

TIN PLATE PRICES, PAGE 1522

Pittsburgh, May 29.—Can makers are busily engaged getting tin plate supplies for July shipment and recent orders have been fairly heavy. Numerous requirements comprise single carloads although the larger customers are purchasing several hundred tons at a time. Some of these single carload shipments may be made in June if makers find it convenient to work them in with other rollings. In the main however, not much tin plate is available for shipment during the remainder of the second quarter. A lull is expected in between the tin plate demand for the pea crop and requirements for the corn and tomato crops which follow in sequence. The Liberty Steel Co., Trumbull Steel Co., N. & G. Taylor Co. and several other tin plate producers near Pittsburgh all are working 100 per cent as are several plants of the American Sheet & Tin Plate Co. A general average is $4.75 per base box of 100 pounds, Pittsburgh.

Third Quarter Contracting

New York, May 29.—Further third quarter contracting has featured the tin plate market here during the past few days. This business has been entered on the basis of $4.75 per base box, Pittsburgh. Tin plate off stock lists continues to bring $4.50, base Pittsburgh, on the average.

Shape Bookings Increase

April Awards, Based on Government Reports from Fabricators, Reach 177,600 Tons—May Business Continues Strong, Week's Report Shows

STRUCTURAL SHAPE PRICES, PAGE 1522

Washington, May 29.—The census bureau states 'orders for fabricated steel placed in April almost equaled the capacity of the fabricating firms, according to reports by companies comprising two-thirds of the fabricating capacity of the United States. Sales reported in April amounted to 115,247 tons by 75 firms having a capacity of 116,916 tons, or at a rate of 99 per cent of capacity. At this rate total sales throughout United States based on total capacity of 180,000 tons were 177,600 tons in April. This compares with 139,300 tons reported for March by the Bridge Builders and Structural society based on reports of 64 firms showing sales at 77 per cent of capacity."

Monthly comparisons on the old basis for all except April are as follows:

Month	Percent	Tonnage
April, 1922	99	177,600
March	77	139,300
February	43½	78,700
January	40	72,100
December, 1921	40	71,500
November	55¼	99,800
October	54	97,800
September	48	86,000
August	33	59,302
July	33¼	60,200
June	37	66,900
May	28	50,800
April	31	55,900
March	29	52,300

Deliveries Six Weeks Deferred

Pittsburgh, May 29.—Numerous demands made recently on the steel mills for structural material have been filled most of them up for from 6 to 10 weeks. Deliveries are correspondingly deferred. Prices are firm at around 1.70c, Pittsburgh, although the complete spread is 1.50c to 1.75c. Fabricators are stiffening up somewhat on their prices and some jobs offered at around $60, erected, are being turned down, including one in Youngstown, O. involving 800 tons. One of the largest jobs placed with the American Bridge Co. recently involved 1500 tons for transmission towers for the Detroit-Edison Co., Detroit. The McClintic-Marshall Co. was awarded the power house for the state asylum, Danville, Pa., 500 tons. Several bridges are coming up for attention in Beaver county and the Pennsylvania railroad power house at Pitcairn and Enola, Pa., 1000 tons each, is reported placed with the McClintic-Marshall Co. A large number of municipal lettings, including waterworks, etc., are scheduled for early attention but these involve relatively unimportant tonnages.

Chicago Buying Somewhat Less

Chicago, May 29.—Awarding of structural tonnages is decidedly less than recently and the total for the past week in the West is smaller. As the season advances fewer large projects are coming forward, but with former orders fabricators will find sufficient to keep them busy and mills have large tonnages of shapes on their books. Prices are unchanged with the market practically 1.70c, Chicago mill, on structural shapes although occasionally $1 per ton over this price is obtained.

Building Activity Hesitates

Boston, May 29.—The rush of structural awards which has taken place in this market during the past few weeks temporarily has halted, but prices are firm and new work developing indicates that the peak of activity is still to be reached. Recent awards have been limited to small tonnages, many at $60 a ton fabricated.

Month's Total 40,000 Tons

New York, May 29.—While structural buying recently was slower, May has been one of the most active months in more than two years. It is estimated close to 30,000 tons have been placed in this district. Prices at the same time have advanced to approximately $70 a ton erected. Plain material is 1.70c Pittsburgh.

More Business Placed

Cleveland, May 29.—Greater activity continues to be noted in the structural steel market of this district. Award of 1200 tons for a bakery at Youngstown, O., to the American Bridge Co.; 1000 tons for a department store addition, Cleveland, to the Republic Structural Iron Works of which 800 tons is to be Bethlehem sections and several smaller jobs ranging down to 110 tons, feature the business of the past week. Mills are not promising a prompt delivery as formerly. Some good buying of shapes for stock purposes up to single lots of 1000 tons is being done. In prices 1.60c Pittsburgh is minimum with small lots going higher.

Activity Is Pronounced

Philadelphia, May 29.—Numerous lettings and new projects continue to feature the structural market. The demand for shapes continues active. Good sized tonnages are being placed right along. On a considerable portion of this business 1.70c base, Pittsburgh is being done and this is the minimum price with most of the independents. However, 1.60c continues the price of some of them and the leading interest continues to take care of the requirements of its regular customers at this price. Included in last week's bookings were several lots for June, July and August delivery at 1.70c.

CONTRACTS PLACED

Awards reported this week ..... 18,560 tons
Awards reported last week ..... 15,862 tons
Awards reported two weeks ago.... 44,481 tons

1750 tons, building for Buffalo Athletic club, Buffalo, to Lackawanna Bridge Works Corp.
550 tons, Francis Marion hotel, Charleston, S. C., to McClintic-Marshall Co.
Tonnage not stated, plant for Yawman & Erbe Mfg. Co., Rochester, N. Y., to S. L. Heughes Co., Rochester.
200 tons, additions for automobile body shop for Nash Motors Co., Milwaukee, to Worden-Allen Co.
100 tons, foundry extension for Rundle Mfg. Co., Milwaukee, to Worden-Allen Co.
150 tons, trestle for Inspiration Copper Co. of Arizona, to Wisconsin Bridge & Iron Co.
130 tons, trestle for Michigan Smelting Co., Houghton, Mich., to Worden-Allen Co.
1500 tons, transmission towers for Detroit-Edison Co., Detroit, to the American Bridge Co.
500 tons, power house, state asylum, Danville, Pa., to McClintic-Marshall Co.
750 tons, three 55,000-barrel tanks for erection at Orangeville for Tidewater Pipe Co., Bradford, Pa., to Reeves Bros. Co., Alliance, O.
310 tons, high bridge, Raymond, Wash., to Penn Bridge Co.
100 tons, garage, Providence, R. I., to independent fabricator.
100 tons, alumni building, Wellesley, Mass., to independent fabricator.
150 tons, high school, Millinocket, Me., to independent fabricator, general contract to Foundation Co., New York.
1200 tons, building for Ward Baking Co., Youngstown, O., to American Bridge Co.
110 tons, branch bank, Cleveland Trust Co., Cleveland, to King Bridge Co.
310 tons, first unit of Moreland Court apartments, Cleveland, to King Bridge Co.
1000 tons, apartment house, 104th street and Broadway, New York, to A. E. Norton, Inc.
200 tons, residence in East Seventy-first street, New York, to Eidlitz & Ross.
750 tons, warehouse for Horace T. Potts & Co., Philadelphia, to Phoenix Bridge Co.
2000 tons, Pennsylvania railroad shops, Pitcairn and Enola, Pa., reported placed with McClintic-Marshall Co.
1000 tons, addition to the Higbee Co. store, Cleveland, to Republic Structural Iron Works, 800 tons of Bethlehem sections involved.
700 tons, for Warren bridge over Gunpowder river near Baltimore, to Phoenix Bridge Co.
1500 tons, for office building, Tenth and Chestnut streets, Philadelphia, to Phoenix Bridge Co.
2000 tons, Middle City Realty Co. building, Philadelphia, understood to have been placed with American Bridge Co.
1500 tons, blast furnace Port Henry, N. Y. for Witherbee, Sherman & Co. to Riter-Conley Co.; 500 tons unplaced.

CONTRACTS PENDING

1000 tons, Medical Center building, Cleveland, bids to be taken soon; W. S. Perguson Co., Cleveland, engineer.
900 tons, plant addition for Newton Steel Co., Newton Falls, O., bids being taken.
500 tons, branch bank, Cleveland Trust Co., Euclid avenue and East Seventy-ninth street, Cleveland, bids being taken.
400 to 500 tons, filtration plant, Bay City, Mich., to come up shortly.
1600 tons, Federal Reserve bank, Minneapolis, Minn., bids in.
200 tons, high school, New Bedford, Mass. Bids in.
150 tons, high school, Waltham, Mass., bids being taken.
150 tons, high school, Fitchburg, Mass., bids in.
300 tons, building for Boston college, Boston, bids being taken.
150 tons, school building, Fitchburg, Mass., C. H. Cunningham & Son Co., Lynn, Mass., general contractor.
1000 tons, department store, Scranton, Pa., Bethlehem Fabricators, Inc., understood to be low.
1100 tons, Hyman office building, Sixteenth and Walnut streets, Philadelphia, bids being taken.
2000 tons, Delaware river bridge piers, bids opened May 31.

Valley Operating Rates Show Little Change

Youngstown, O., May 29.—No material change is noticed in this week's operating schedules compared with a week ago. Open-hearth operation at independent plants remains at 88 per cent while the rate of sheet mill operation advanced to 87 per cent. The 45 open-hearths now making heats are distributed 11 each at the Republic Iron & Steel Co., the Brier Hill Steel Co. and the Youngstown Sheet & Tube Co.; seven at the Trumbull Steel Co. and five at the Sharon Steel Hoop Co.

Of the 113 sheet mills in the valley 98 are active. The Brier Hill Steel Co. has 20 mills under power, the Republic Iron & Steel Co. and the Youngstown Sheet & Tube Co. 15 each, the Trumbull Steel Co. 13, the Newton Steel Co. 10, the Sharon Steel Hoop Co.

the ... con Steel Co. and the Mahoning Valley Steel Co. eight each, giving a ratio of 87 per cent which compares with 90 per cent the week before.

Miscellaneous operation remains practically unchanged. The Trumbull Steel Co. is working 29 hot tin mills and all strip departments; the Brier Hill Steel Co. one plate mill; the Youngstown Sheet & Tube Co. eight pipe furnaces and its rod and wire departments; and the Republic Iron & Steel Co. five pipe furnaces.

Wire Demand

Continues Fair Although Aggregate Tonnage Booked Somewhat Smaller

WIRE PRICES, PAGE 1522

Pittsburgh, May 29.—Wire and wire products still are in fair demand although the aggregate tonnage being booked is not as large as it was a few months ago when spring business in barbed wire and fencing constituted the major portion of the orders written. Tonnages of plain wire are being booked by certain mills for third quarter shipment although several still refrain from committing themselves that far ahead. The price involved in this third quarter business is 2.25c, base Pittsburgh, the same as the prompt market price. Large shipments of nails continue to be made and moderate sized orders are being booked weekly by independent makers at 2.50c, although nothing is closed at that level for extended delivery. The American Steel & Wire Co.'s price on nails is unchanged at 2.40c, base Pittsburgh.

Strong Demand Continues

Chicago, May 29.—While the abnormal demand for wire and nails which prevailed for several weeks has moderated somewhat, new business in this line is strong and what might be called a normal tonnage for the season. For some time an unusual run of orders was met because of lack of stocks in the hands of jobbers and consumers. Buying of barbed wire continues heavy but is expected to grow somewhat less as the season advances. Heavy pressure for delivery is being met but it is difficult to give prompt shipments, inasmuch as stocks at mill warehouses have been depleted. Prices remain unchanged.

To Postpone Rate Case

Washington, May 29.—Interstate commerce commission has announced that after the presentation of the carriers' side in the southern class rate case, at Atlanta about June 20, the case will be postponed until July 12, when cross-examination of the carriers' witnesses will begin. Shippers will be given opportunity to present their case in Atlanta, New Orleans, Chicago, New York and Asheville, N. C., after Sept. 1.

To Sell Replogle Iron

Ralph W. Clark, for 22 years pig iron salesman in the New York office of Roger-Brown & Co. has resigned to become New York district sales agent for Pilling Co., Philadelphia. As such he will dispose of the output of the Replogle Steel Co. furnaces in New York territory, with offices at 2 Rector street.

Car Buying Slows Again

Railroad Rolling Stock Bookings in Week Drop to Less Than 3000—Inquiry Small—Gary Rail Mill Makes 10,000 Tons Weekly

RAILROAD TRACK MATERIAL PRICES, PAGE 1522

New York, May 29.—The week's leading car order calls for 2000 box cars for the Atchinson, Topeka & Santa Fe, this business being distributed among three builders. Other orders are relatively small. New inquiry calls for 1000 box cars for the Kansas City Southern, and 900 for the Seaboard Air Line.

Locomotive orders include six for the Peoria & Pekin Union, the business going to the Lima Locomotive Works; five for the Norfolk Southern awarded to the Baldwin Locomotive Works; and one for the United Sugar Companies of South America, also awarded the Baldwin company.

More Cars are Placed

Chicago, May 29.—Additional car buying has been done, a total of 2750 being placed in the past few days. The Santa Fe has distributed 2000 refrigerators among three builders, and the Wabash ordered 750 steel car bodies. The Union Refrigerator Transit Co. is inquiring for more refrigerator cars and underframes. Demand for steel rails is insistent and so large a tonnage is required to meet needs of roads that the mill at Gary probably will increase its output as soon as means can be found to provide the steel. At present it is producing 10,000 tons per week. Demand for track fastenings continues strong and comparatively large lots are being placed to match tonnages of rails being shipped. No change in price is made although the general tendency of the market is upward. Light rails are in comparatively small demand, attributed to inactivity of coal mines.

Present Orders are Small

Pittsburgh, May 29.—Most of the present orders for light rails comprise 50 or 100 tons each. Coal companies in certain sections continue to buy but light rails have not advanced in price along with other steel products due to the lack of demand. The market is firm at 1.50c with some makers quoting 1.60c, base Pittsburgh. Rerollers are quoting 1.45c. Track accessories continue in spasmodic demand. One of the latest entrants for tie plates is the Pittsburgh, Shawmut & Northern for 10,000 tie plates. These are quotable at a minimum of 1.75c, base Pittsburgh. The price on track bolts still is 3.00c to 3.50c, base Pittsburgh. Standard spikes are firm at 2.25c. The aggregate of business booked in small spikes in the past three months is sizable. They are quoted at 2.50c, base Pittsburgh.

Will Operate Plant

St. Louis, May 29.—Railroad buying continues in volume. Officials of the American Car & Foundry Co. have announced that work at the Madison, Ill., plant on 4436 cars will begin in July or August. This work will necessitate increasing the working force from 1300, the present complement, to 2200. The company is now working on repair orders, which will not be completed until midsummer. Wabash officials say they have split their recent order for 36-inch wheels between the Edgewater Steel Co. and the Illinois Steel Co.

Buy Miscellaneous Lots

Philadelphia, May 29.—Good miscellaneous railroad buying is reported and included several sizable lots of tie plates placed recently at prices ranging from 1.75c to 2.25c, base Pittsburgh. Buying of frog and switch material also is good. The Pennsylvania railroad has bought 70,000 to 90,000 heat treated track bolts and 2500 kegs of spikes. Smaller orders for these materials also have been placed by other railroads and the Pennsylvania is expected to place an additional quantity shortly.

CAR ORDERS PLACED

Atchison, Topeka & Santa Fe, 2000 box, 1000 to Pullman Co., 500 to American Car & Foundry Co. and 500 to Standard Steel Car Co.
Chile Exploration Co., 50 ore cars, to Pressed Steel Car Co.
Missouri, Kansas & Texas, 200 refrigerator, to American Car & Foundry Co.
Fort Smith & Western, 125 steel center constructions, to Western Car & Foundry Co.
Nickel Plate, 100 steel center constructions, to Illinois Car & Mfg. Co.
Nickel Plate, 400 refrigerators, to Merchants' Despatch.
Belt Railway of Chicago 100 hoppers, to Western Car & Foundry Co.
Wabash, 750 steel car bodies to Standard Steel Car Co.

CAR ORDERS PENDING

Baltimore & Ohio, 1000 hopper and 500 box, bids being taken.
Union Refrigerator Transit Co., 350 refrigerator cars and 150 steel underframes, bids asked.
Erie, 3000 car repairs, pending.
Kansas City Southern, 1000 box, bids asked.
Seaboard Air Line, 900 box, pending.

Blast Furnace Awarded

Contract for the construction of the new 400-ton blast furnace which will be erected at Port Henry, N. Y., by Witherbee, Sherman & Co., has been awarded to the Riter-Conley Co., Pittsburgh. About 1500 tons of steel is represented in the contract and 500 tons of structural work yet is to be awarded. Details of the proposed new furnace were given in THE IRON TRADE REVIEW May 18. Freyn-Brassert & Co., Chicago, are the engineers.

Alan Wood Raises Wages

Philadelphia, May 29.—The Alan Wood Iron & Steel Co., which reduced wages about Feb. 1 by 10 per cent, restored this cut effective today. This follows the advance by the Lackawanna Steel Co. recently from 23 to 26 cents an hour for common labor. The Alan Wood and other companies in the Schuylkill valley now are paying common labor 29 cents.

Edward I. Petze has been appointed trustee in bankruptcy of the estate of the Acme Machine Co., Hartford, Conn.

Concrete Bar Lots Gain

Week's Awards Approximately 6000 Tons—More Sizable Jobs Coming Up—Quietness in Some Markets Followed by Activity in Others

REINFORCING BAR PRICES, PAGE 1522

New York, May 29.—Business in concrete bars again is more active. Numerous contracts have been let in this district and in the general eastern territory and in addition a great many small orders have been placed and numerous small lots are up for action. As a rule, the market in concrete bars for mill shipment is 1.60c base Pittsburgh, although for fairly prompt shipment the mills have obtained 1.70c. For warehouse shipment from the mills, 2.10c base Pittsburgh is being done.

Orders Vary Weekly

Pittsburgh, May 29.—Orders for reinforcing concrete bars to the steel mills are large one week and small the next. The past week witnessed a falling off although numerous jobs are pending involving all the way up to 1500 tons. Bids closed Saturday on the buliding for the Standard Supply Co., Northside, Pittsburgh, 140 tons. The Pittsburgh Engineering & Construction Corp. is low bidder on the John Morrow high school annex, 100 tons. Prices are unchanged at 1.60c to 1.75c, base Pittsburgh.

Await 1000-Ton Award

Cleveland, May 29.—The 1000 tons of reinforcing bars for the Union Trust Co. building this city has not yet been placed by the general contractor, the Thompson-Starrett Co. It is understood this business will be placed in Chicago. Smaller tonnages are more numerous. A 150-ton lot was placed locally this week but the job for which it was intended was not disclosed. A 225-ton job for Delaware, O. is pending. Prices are firm at 1.60c Pittsburgh.

Lull In Large Tonnages

Chicago, May 29.—While concrete bar sellers have much business already under contract and are booking a fine aggregate of new business, it is mostly in small lots and the more important projects are not much in evidence at the moment. The Grant Park stadium at Chicago is still progressing and bids are due early in June. Hotel and apartment buildings are expected to provide considerable tonnages later.

CONTRACTS PLACED

Awards reported this week.....	6,055 tons
Awards reported last week.....	3,958 tons
Awards reported two weeks ago.....	2,905 tons

300 tons, department store addition for the Higbee Co., Cleveland, to Republic Structural Iron Works; general contract to Crowell & Little Construction Co.

350 tons, Baltimore & Ohio railroad storage warehouse, Philadelphia, to Concrete Steel Co.

100 tons for Pennsylvania warehouse, Philadelphia, to Concrete Steel Co.

500 tons for two schools, Philadelphia, to American Concrete Engineering Co.

125 tons for school at Islip, L. I., to Concrete Steel Co.

350 tons for high school, Hartford, Conn., to Concrete Steel Co.

209 tons for building for American Chocolate Products Co., Newburgh, N. Y., to Corrugated Bar Co.

450 tons for University of Pennsylvania stadium, Philadelphia, to Concrete Steel Co.

150 tons for Commonwealth Engineering Co., to Truscon Steel Co.

100 tons for Dretsch Engineering Co., to Truscon Steel Co.

250 tons for Frances Marion hotel, Charleston, S. C., to Corrugated Bar Co.

200 tons for school No. 37, Jersey City, N. J., to Corrugated Bar Co.

175 tons for viaduct at Wilkes-Barre, Pa., to National Steel Rolling Co.

300 tons, high school at Follandbee, W .Va., to Concrete Steel Co.

Tonnage not stated, plant for Yawman & Erbe Mfg. Co., Rochester, N. Y., to Concrete Steel Co.

155 tons, junior high school, Rockford, Ill., to Corrugated Bar Co., general contractor Security Building Co., Rockford, Ill.

1000 tons, warehouse for Studebaker Corp., South Bend, Ind., general contract to H. S. Christman Co.

1200 tons, building for Hupp Motor Car Co., to Corrugated Bar Co.

150 tons, grade reduction work for Illinois Central railroad, to Corrugated Bar Co.

CONTRACTS PENDING

200 tons, warehouse for William Higgins, Long Island City, pending.

250 tons, two apartments in Baltimore, pending.

225 tons for building for Ohio Western university, Delaware, O., general contract to E. Elford, Columbus, O.

250 tons, high school building, Danville, Ill., bids close June 8.

100 tons, Lincoln bachelor apartments, Chicago, bids closed May 30.

100 tons, Arlington apartment building, Chicago, bids closed May 31.

140 tons, building for Standard Supply Co., Pittsburgh; bids closed May 27.

100 tons, annex for Morrow high school, Pittsburgh; Pittsburgh Engineering & Construction Corp. low bidder.

Delay Price

Advance on Steel Pipe—Sizable Orders Still Are Pending

PIPE PRICES, PAGE 1522 AND 1606

Pittsburgh, May 29.—Small orders continue to rule in connection with all tubular goods. Jobbers furnish a large percentage of these, apparently aiming to keep only well balanced stocks. This refers particularly to standard full weight merchant pipe orders for which continue to come from numerous widely distributed supply companies. The card discounts of Dec. 15, 1921 still are the same and numerous buyers are accumulating small stocks apparently in the expectation that a new card involving higher prices shortly will come out. The issuance of this price increase due before or at this time, aparently is delayed owing to the fact that makers consider such an action now would be inopportune because of the coal strike. Numerous large line pipe tonnages still are pending and while from time to time fair-sized tonnages will be placed and many buyers will get under cover before the advance some the of larger ones will be deferred for six months to a year.

Bids To Be Opened

New York, May 29.—Bids will be opened June 9 by the water department on 500 tons of eight to 12-inch cast iron pipe and fittings for Brooklyn. Other municipal inquiries include several hundred tons of cast iron pipe for Scottsville, N. Y., bids to be opened June 14; a small tonnage for Compton Lakes, N. J., contractor's bids to be opened June 8; and 250 tons for delivery to Bernardsville, N. J., inquiry issued by borough of Mendham, N. J., bids to open June 12. While another eastern seller has advanced prices $2 a ton the market remains virtually unchanged at $48.50 to $49.80, for 6-inch pipe and over, and $51.50 to $53.80 on 4-inch pipe. Shading is noted where tonnages are especially desirable On a relatively small lot, about 200 tons, for Newark, N. J., awarded recently, R. D. Wood & Co., the successful bidders quoted $48.80, on the 4-inch pipe, delivered Newark, and $44.80 on the 6, 8 and 12-inch.

Higher Prices Impending

Birmingham, Ala., May 29.—An advance of $1 in cast iron pipe prices has been announced for June 1. Lettings, while not so numerous, are still adding to the business being booked. Production is to be increased in June when the United States Cast Iron Pipe & Foundry Co. starts up the pits in its North Birmingham plant in which has been installed special machinery for making pipe. All pipe companies in the district have business on books which will warrant steady operation for some weeks to come.

More British Ferro

Sold at $67.50 Tidewater—German at $66—Spiegel Scarce

FERROALLOY PRICES, PAGE 1522

New York, May 29.—Several sales of English ferromanganese have been made during the past week at $67.50, c.i.f tidewater. This business totals well over 1000 tons. Some of it is for June shipment from England and the remainder over the second half. Sales of domestic ferromanganese have been restricted to a few carloads which went on the basis of $70, tidewater. Several carloads of German ferromanganese for prompt shipment from Germany have been sold at $66, tidewater. The above figures indicate the current market. At least two large inquiries for ferromanganese now are before the trade. Sales of a few carloads of spiegeleisen have been made during the past week at $35, furnace, for 20 per cent metal. Little spiegeleisen is obtainable since most of the output of the only furnace now producing has been sold for a considerable period ahead. The price is firm and tending upwards.

Ferrotungsten prices are firm with fair buying by tool steelmakers. Imported material now held is at 40 to 42½ cents per pound contained. Other alloy prices are unchanged with good specification on old contracts and comparatively light new business.

Small Tonnages Involved

Pittsburgh, May 29.—Briskness has disappeared from the ferroalloys market. Demand even for ferromanganese is limited, the chief development of the past week in connection with the

metal being the tendency of American producers to meet the English price of $67.50, seaboard. Single carload domestic business for prompt or extended delivery carries the $70 seaboard price. The Otis Steel Co., Cleveland, was a recent purchaser of 300 or 400 tons. The Carnegie Steel Co. continues out of the current market with a price of $72.50, seaboard.

In connection with spiegeleisen, several sales recently aggregating 200 or 300 tons were made in the East but locally the market has been quiet. Negotiations are in progress on a carload of mixed spiegeleisen, 12 to 30 per cent material, on which $35, furnace, is asked. The Crucible Steel Co. of America has not purchased its 100 tons nor has it closed on requirements of low grade ferrosilicon involving 200 tons. An inquiry now is current from a Pittsburgh district user for one carload of 50 per cent ferrosilicon. This grade continues quotable at $57.50 to $62.50.

Seek June Requirements

Chicago, May 29.—Ferromanganese is strong at the prices which have been in effect. Users have begun to inquire for their June requirements. Spiegel is more active as its scarcity renders buying more difficult. Carlots to 100 tons have been inquired for. The quotation is $47 delivered Chicago.

Fluorspar Sales Keep Up

Pittsburgh, May 29.—Recent sales of fluorspar have involved fairly sizable quantities although none is as large as the Midvale Steel & Ordnance Co.'s purchase of 1500 tons. One order placed with a Pittsburgh seller recently by a Mahoning valley consumer calls for 500 tons and the Jones & Laughlin Steel Co. is bringing in 750 tons by barge from Cairo, Ill., a purchase made a few weeks ago. The minimum quotation on fluorspar today is $16 for unguaranteed material, the $15 price having entirely disappeared; $17 applies to guaranteed 85 and 6 per cent material, while $17.50 is the market price of the guaranteed 85 and 5 per cent grade of material.

To Finance Expansion

Stockholders of the Newton Steel Co., Youngstown, O., are expected to ratify May 31 the recommendation of a bond issue of $750,000 for the purpose of installing six additional sheet mills at its Newton Falls, O. plant. If such is the case the work will begin immediately. The present installation includes 10 motor-driven mills for rolling high-grade sheets for automobiles, furniture, etc. The building housing the present complement of mills will be extended to make room for the additional eight units under consideration and upon their completion the plant will be equipped to produce about 96,000 tons of fine finished sheets annually.

The Milwaukee county circuit court has denied the application of Chris Thomson, a stockholder, for the appointment of a receiver for the Hercules Steel Casting Co., Milwaukee.

The Nonferrous Metals

Copper, Zinc and Lead Go to High Prices of Year—Brass Products up—All Buying Good

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	†Nickel spot
May 24.....	13.93½	13.93½	31.00	5.70	5.20	18.00	5.40	34.00
May 25.....	13.93½	13.93½	31.07½	5.75	5.20	18.00	5.40	34.00
May 26.....	13.93½	13.93½	31.00	5.75	5.25	18.00	5.40	34.00
May 29.....	13.93½	13.93½	31.62½	5.75	5.25	18.00	5.40	34.00
May 30.....	Holiday							

†Open market quotation.

NEW YORK, May 29.—Copper and zinc prices reached new high levels for the year, with a continued good volume of bookings, in the past week. Lead business has been lighter than in previous weeks, while the aluminum and antimony markets have shown little change. A moderate business has been done in tin, although some concern has been felt in the tin trade as to the forthcoming report of the statistical position as of May 31.

The steady rise in the copper market has been the feature of the metal markets. Electrolytic copper sold for prompt delivery at 14c, delivered, recently, while export sales were made on the basis of 14.00c to 14.12½c, c.i.f. European port. Estimates of total May sales average 200,000,000 pounds, which would be the largest so far this year. Bookings for export are placed at 80,000,000 pounds and the remainder for domestic account. The wire mills have reached the best position since the armistice, with many drawers working 24 hours and booked three to four months ahead. Brass rolling mills have also been taking heavier orders, from widely distributed consuming lines. The mills have been compelled to buy more copper and zinc than heretofore, due to the absorption of supplies of brass scrap. Foundries have been buying casting copper more freely and the differential between electrolytic and casting has narrowed down from ¾c to ½c.

The June offerings of zinc have been limited, as production for this month has been well sold and producers have been selling from stock only at advancing prices.

Lead prices, after a slight reaction, crept a little higher in the outside market. Sales were made on the basis of 5.50c, East St. Louis, and 5.70c to 5.75c New York, for prompt and June shipments. Cable and battery manufacturers have been good buyers, while pigment makers continue active. Consumption of this metal continues heavy; stocks have been sharply reduced, and the situation of the producers is considered satisfactory.

Shipments of tin from the Straits the first 20 days of May totaled over 4000 tons and it has been estimated the total shipments for the month would reach the unusual total of 7000 tons. This being the case, it is thought the visible supplies May 31 would show an increase of some 2500 tons over April 30. Despite this statistical outlook, the London market has been firm and prices here have been relatively steady, ranging between 30.75c and 31.25c for Straits for all positions. Banca has been offering for shipment from Batavia at ⅜ to ½ cent under Straits; 99 per cent at ¾ cent under Straits.

The aluminum market has been irregular, with 98 to 99 per cent virgin quoted 18c to 19c, New York, and with sales at both price levels. Aluminum scrap has continued in good demand.

Antimony business has been quiet, at 5.40c, duty paid New York, with the trade waiting further action on the tariff.

Brass and copper rolled products were advanced in price May 22, the increase being ½ cent on copper products and seamless tubes, ¼ to ⅜ cent on brass products. This advance reflected the further rise in copper ingot price to 13.75c, delivered.

Mill Products

(Base prices, f.o.b. mill)

SHEETS	
Copper, hot rolled 24 oz., min....	20.25
High brass	16.50
Zinc, ga. 9 to 18 (plates ½c less)	7.50
Lead, full sheets (cut ¼c more).	8.75
SEAMLESS TUBES	
High brass	19.50
Copper	22.25
RODS	
High brass, round, ⅝ to 2½ inch	14.50
Naval brass rod.....	17.00
WIRE	
Copper	14.75 to 15.50
High brass	17.25

Old Metals

(Dealers' Buying Prices)

HEAVY RED BRASS	
Cleveland	8.50 to 9.00
New York	8.25 to 8.50
HEAVY YELLOW BRASS	
New York	5.50
Chicago	5.50
Cleveland	5.50
ZINC	
New York	2.75
Cleveland	3.00
Chicago	2.50
HEAVY COPPER AND WIRE	
Cleveland	10.25 to 10.75
New York	10.75 to 11.00
RED BRASS TURNINGS	
New York	7.25
Cleveland	7.25 to 7.75
YELLOW BRASS TUBING	
Cleveland	5.50 to 6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	5.25 to 5.75
New York	5.25 to 5.50
ALUMINUM BORINGS	
Cleveland	6.50 to 7.00

Attack Steel Tariff Rates

Minority in Senate Deny Industry's Need of Protection and Charge Competition Is Needed—Committee's Schedules Generally Are Adopted

WASHINGTON, May 29—Consideration of the metals schedule of the Fordney tariff bill by the senate sitting as a committee of the whole has precipitated some bitter attacks upon the iron and steel industry by leaders of the minority and some Republicans, but except for a few minor amendments proposed by the majority itself, the senate finance committee's amendments have prevailed. At this time the senate is considering only the changes proposed by the finance committee; those rates not changed will be taken up after the senate, as committee of the whole, has disposed of committee amendments. In the metals schedule the senate has approved the following changes from the house bill:

On wrought and cast scrap iron and steel, $1 per ton (house rate $1.25).

Between spiegeleisen and ferromanganese 30 per cent shall be dividing line (house division was 45).

On muck bars, bar iron, iron slabs, blooms, loops, etc., from 2/10 to ½c pound (house rates from 2/10 to ½ cent).

On steel ingots, blooms, slabs, etc., from 3/10c pound to 25 per cent (house rates from 2/10 cent to 20 cents pound).

On steel containing over 6/10 of 1 per cent nickel, vanadium, etc., additional 10 per cent (house 15 per cent).

On steel containing over 6/10 of 1 per cent tungsten and molybdenum, 72 cents pound on tungsten and $1.25 on molybdenum (house percentage was 1½).

On tin and terne plate, 1 cent pound (house 1 1/10 cent).

On fabricated structural material, 25 per cent (house, 25; senate finance committee, 30).

On steel building forms, 25 per cent (house 40).

On antifriction balls, roller bearings, etc., 10 cents a pound plus 55 per cent (house 10 cents plus 35 per cent).

On spiral nut locks and lock washers, 40 per cent (house 30).

On steel wool, 10 cents a pound; steel shavings, 5 cents a pound, plus 30 per cent on both (house included weight of package).

Democratic attacks upon the rates in the metal schedule, and also the indictment by Senator Cummins of Iowa, were of the tenor that the iron and steel industry is so closely organized there is no competition to insure reasonable prices at all times to consumers, and hence the necessity of foreign competition to make for the desired competition. Thus far in the course of the bill's progress through the senate such bitter criticism had not been poured out.

Senator Underwood, Democratic leader, inaugurated the attack when the first paragraph of the metals schedule came up, that differentiating between pig iron and scrap. Senator Underwood said:

"I do not intend in the end to resist the amendment but I do not care to have the paragraph passed without making some comment on it. The senate committee may bring its experts here, but I think I know what I am talking about when I say that in the manufacture of the heavy materials in the iron and steel schedule the industry of America has no competition in the world's market which can stand against it. Ten years ago I was convinced when chairman of the house ways and means committee, that there were no furnaces in the world which were making pig iron cheaper than the up-to-date American furnace. Of course, if this tax is put on to take care of furnaces ill advisedly built or in a broken down condition, then I will say the tax is not high enough, because some of these furnaces would need from $10 to $15 per ton protection."

The reduction of 25 cents a ton in the duty on scrap prompted no argument, nor did the proposal to make 30 per cent the dividing line between spiegeleisen and ferromanganese. The additional duty on alloy steels, to which Sheffield, Eng., producers have objected, went through without debate

The effort of the minority to make the rate on fluorspar $1.50 a ton also was defeated. The prevailing finance committeee rate was $5.60. The house originally imposed a duty of $5 a ton for the first year, and $4 thereafter.

Trade Commission Still Studies Merger Plan

Washington, May 29.—The federal trade commission yesterday discussed as a body the transcript of last Wednesday's conference at the department of justice at which the commission, the department and representatives of steel companies still figuring in merger talk took up the merger.

At the department of justice conference the steel interests asserted their willingness to submit their merger plans to the federal authorities but asserted none had yet been formulated. Like the commission, the department has not yet reported back on the resolution, and this has prompted Senator La Follette to declare that "the attorney general should proceed to enjoin the formation of this merger of the steel companies."

The unofficial opinion is that the withdrawal of the Youngstown Sheet & Tube Co. has considerably modified the prospects of federal action. Brier Hill Steel Co., Inland Steel Co., Steel & Tube Co. of America, Republic Iron & Steel Co. and the Midvale Steel & Ordnance Co. were represented at the conference.

Ore Is Sought

By American Buyers from Foreign Sources—Interest in Pig Iron Less

Weekly Staff Cable

London, May 29.—Although some American inquiries for British low phosphorus pig iron remain unclosed, the recent buying flurry in British iron from the United States generally has subsided. Interest now has shifted to manganese ore and iron ore. Considerabl North African iron ore business is being done for Chesapeake Bay delivery. Manganese ore merchants say they could ship larger tonnages to the United States than now are going forward if these were available. Russian and Indian manganese ore now are 14d ($0.26) per unit c.i.f United Kingdom.

The British market is likeless. The protracted lockout in the engineering trades is depressing. Two Middlesborough stacks have been damped down, Middlesborough basic is 5s ($1.10) lower. Billets have been cut 2s 6d ($0.56) on account of Belgian competition. The latter now are quoting £6 ($26.70) f.o.b. British works.

Coal Output Makes 500,000-Ton Gain

Another large increase in coal production is indicated for the eighth week of the strike, according to a report issued by the geological survey. The output probably will amount to 5,000,000 tons, based on reports for the first four days of the week. In the sixth and seventh weeks of the strike the production amounted to 4,500,000 tons. The increase during the eighth week may be judged from the fact that loadings on Monday, May 22, exceeded by 652 cars the highest figure previously reported since the strike began. A further increase on Tuesday carried loadings above the 15,000-car mark.

Beehive coke production for the week ended May 20 compared with preceding weeks follows:

	Week ended—			
	May 20, 1922	May 6, 1922	Mar. 25, 1922	Mar. 18, 1922
Penn. and Ohio.	72,000	66,000	134,000	118,000
West Virginia .	8,000	7,000	10,000	9,000
Ala., Tenn. and Georgia	7,000	6,000	8,000	7,000
Virginia and Ky.	8,000	8,000	9,000	8,000
Colo. and New Mexico	3,000	3,000	2,000	3,000
Washington and Utah	2,000	2,000	4,000	4,000
United States total	100,000	92,000	167,000	149,000
Daily average..	17,000	15,000	28,000	25,000

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The Business Trend

June 1, 1922

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Trade recovery receives new impetus from freight rate reduction; improvement noted in widening circle of industries; momentum of upswing insurance against relapse; European outlook greatly helped by bankers meeting at Paris.

INDUSTRIAL ACTIVITY—Nonunion coal output gaining; textile strikes in New England believed near end; April auto output of 218,000 cars compares with peak month of 220,000.

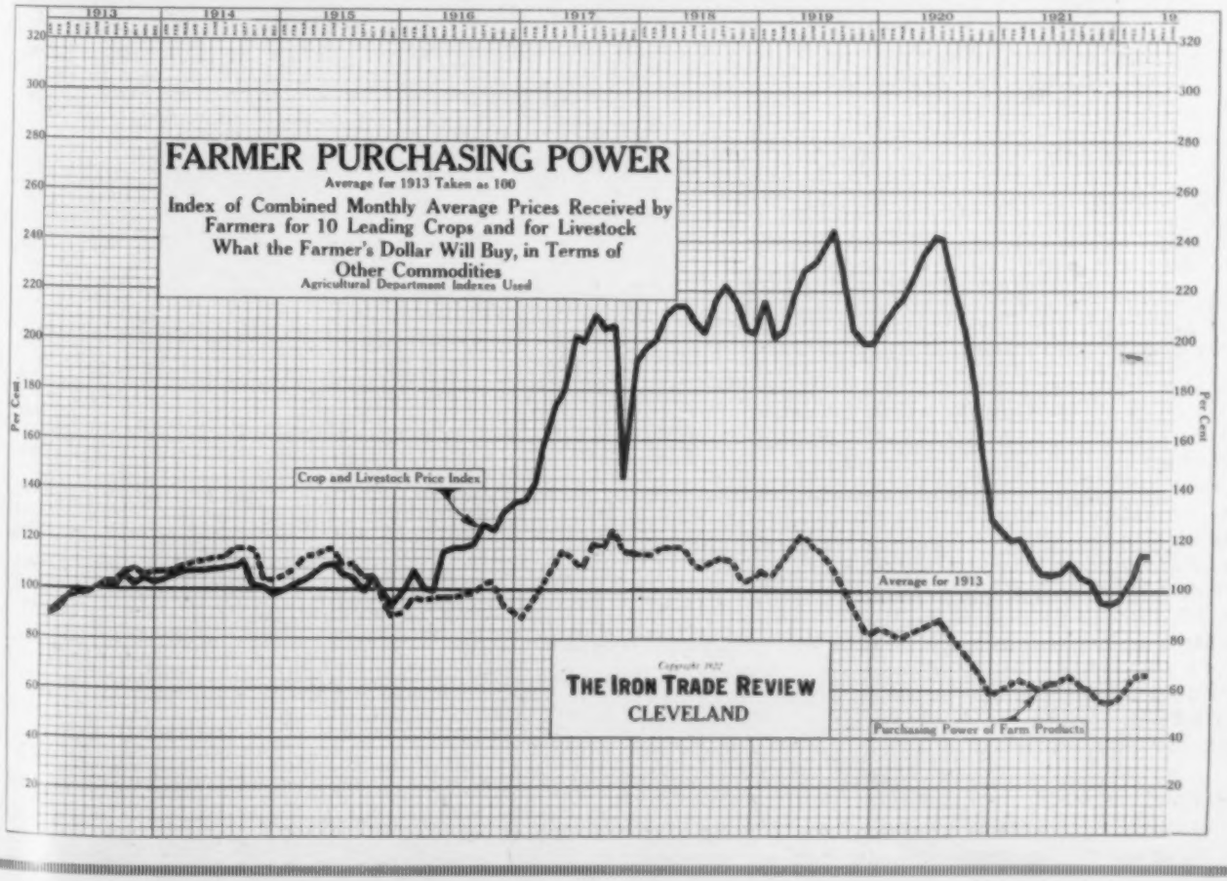
IMMIGRATION—Excess of alien immigration over emigration averaging 7,000 monthly compared with pre-war average of 50,000 and upward monthly; common labor shortage looms.

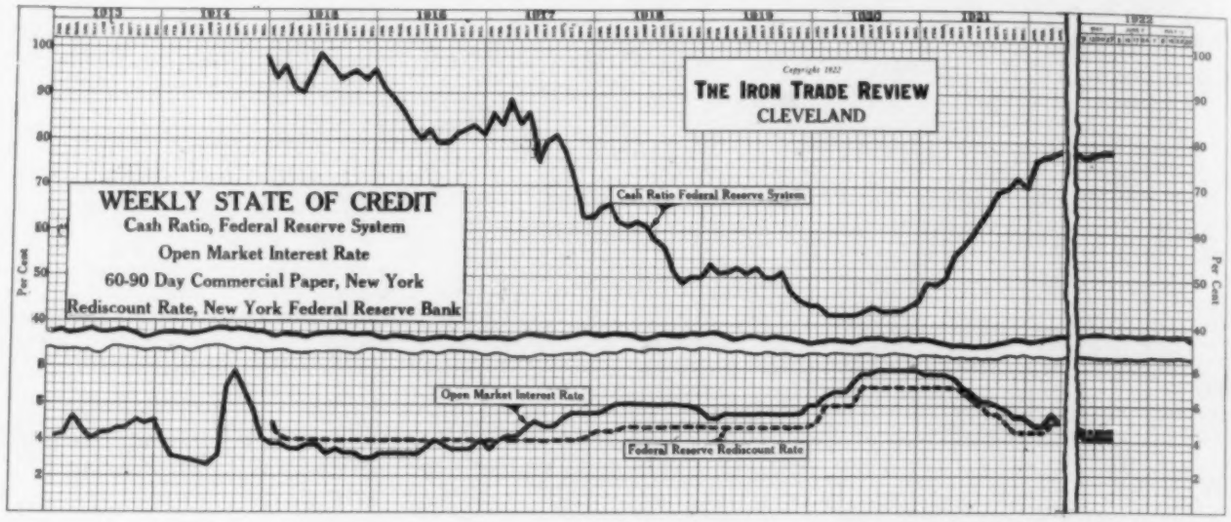
FREIGHT TRAFFIC—Car loadings for week ended May 13 total 777,749 cars, gain of 21,000 over preceding week; 26,000 over same week of 1921; all loadings up save live stock.

FOREIGN EXCHANGE—Firmer rates for sterling and for continental exchanges mark closing of Genoa and opening of bankers meet at Paris; economic improvement abroad seen.

CREDIT CONDITIONS—Federal reserve ratio remains high; interest rates soft; reserve system gold holdings are $3,000,000,000 or 40 per cent of world monetary gold supply.

SECURITY PRICES—Major advance, with interruptions, continues in stocks; bond market picking up after brief lull; proof of confidence seen in sales of new common stock issues.

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Federal Reserve Rediscount Rate
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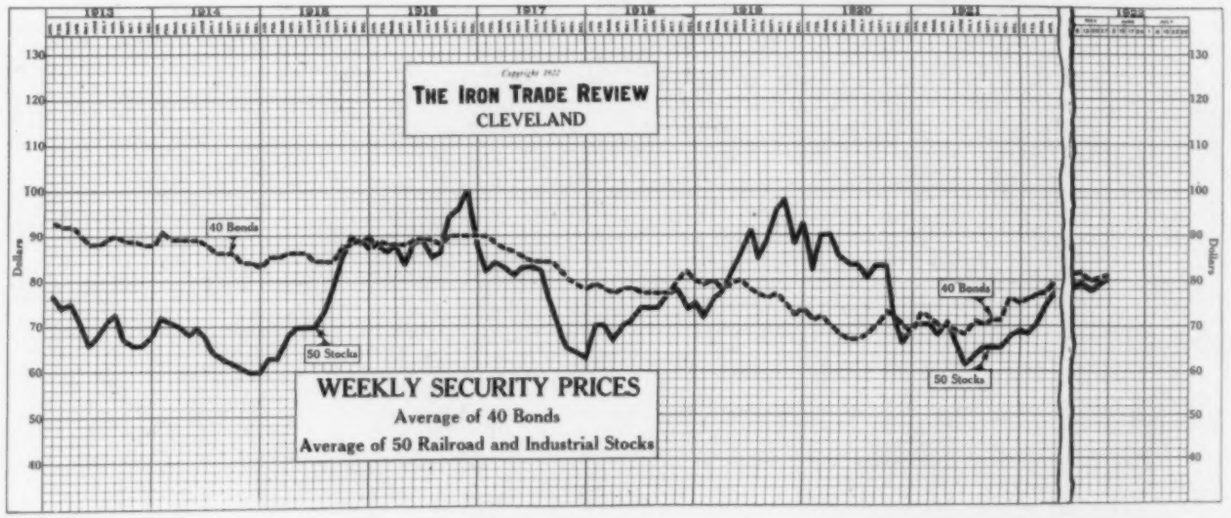
1913
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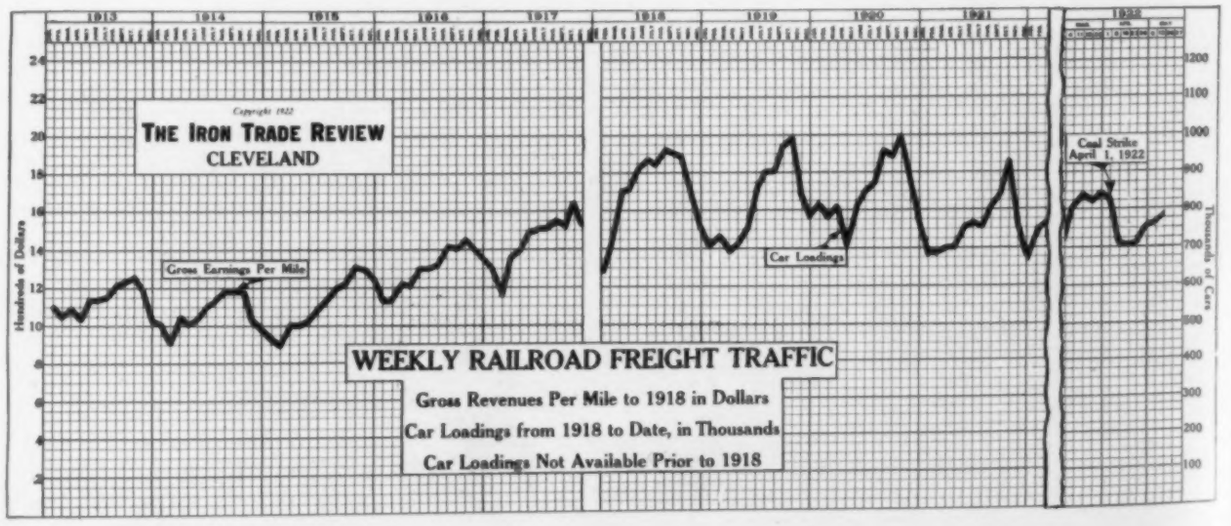
THE IRON TRADE REVIEW
CLEVELAND
40 Bonds
50 Stocks
40 Bonds
50 Stocks
WEEKLY SECURITY PRICES
Average of 40 Bonds
Average of 50 Railroad and Industrial Stocks
Dollars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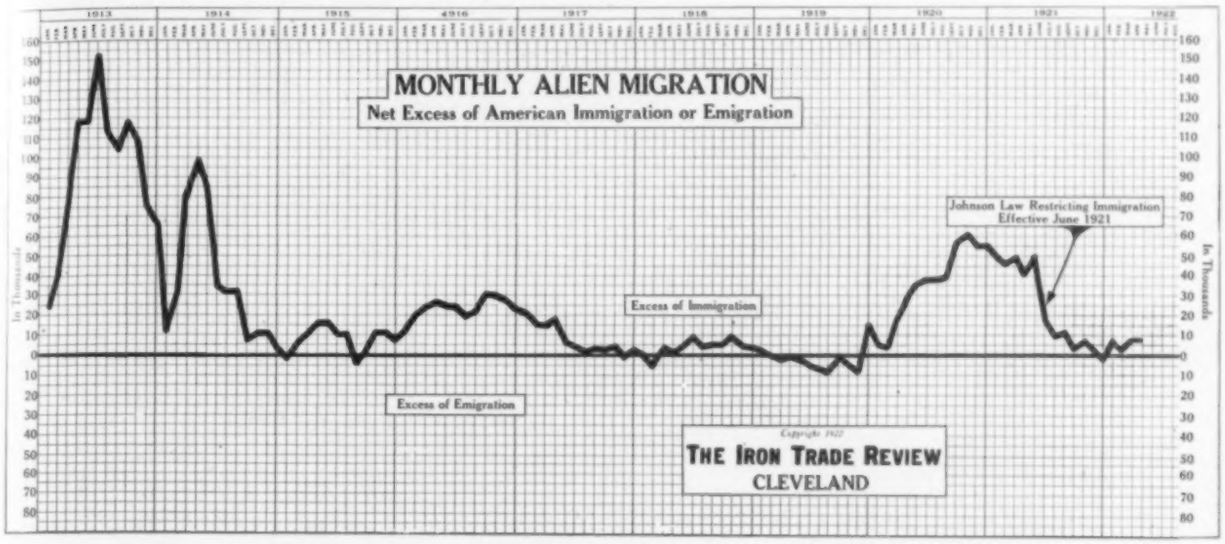
CLEVELAND
Gross Earnings Per Mile
Car Loadings
Coal Strike
April 1, 1922
WEEKLY RAILROAD FREIGHT TRAFFIC
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1918 to Date, in Thousands
Car Loadings Not Available Prior to 1918
Hundreds of Dollars
Thousands of Cars


MONTHLY ALIEN MIGRATION
Net Excess of American Immigration or Emigration
Johnson Law Restricting Immigration Effective June 1921
Excess of Immigration
Excess of Emigration
In Thousands
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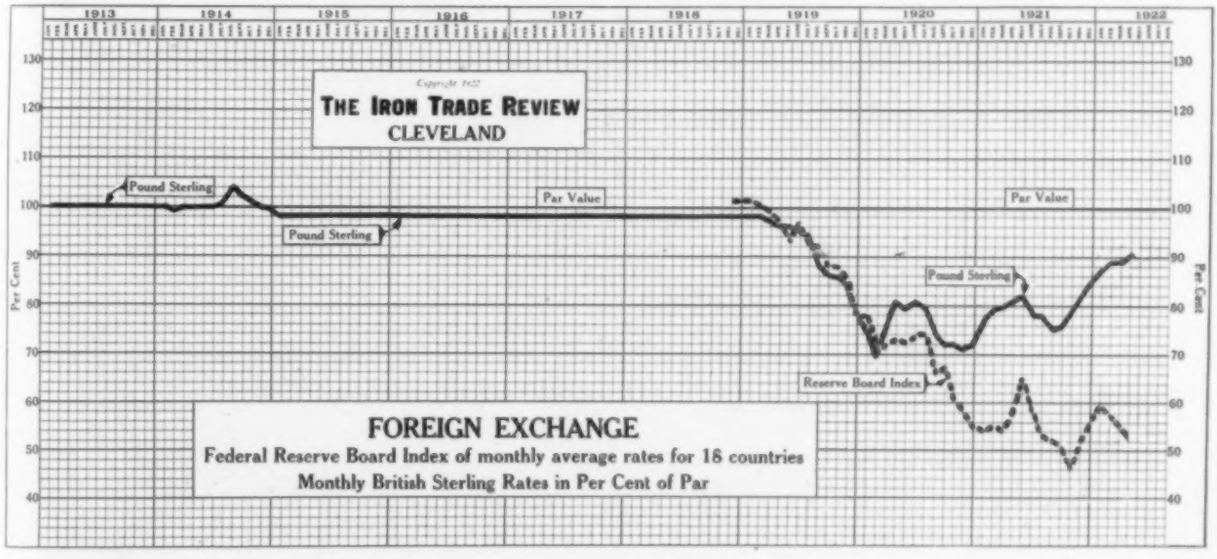
CLEVELAND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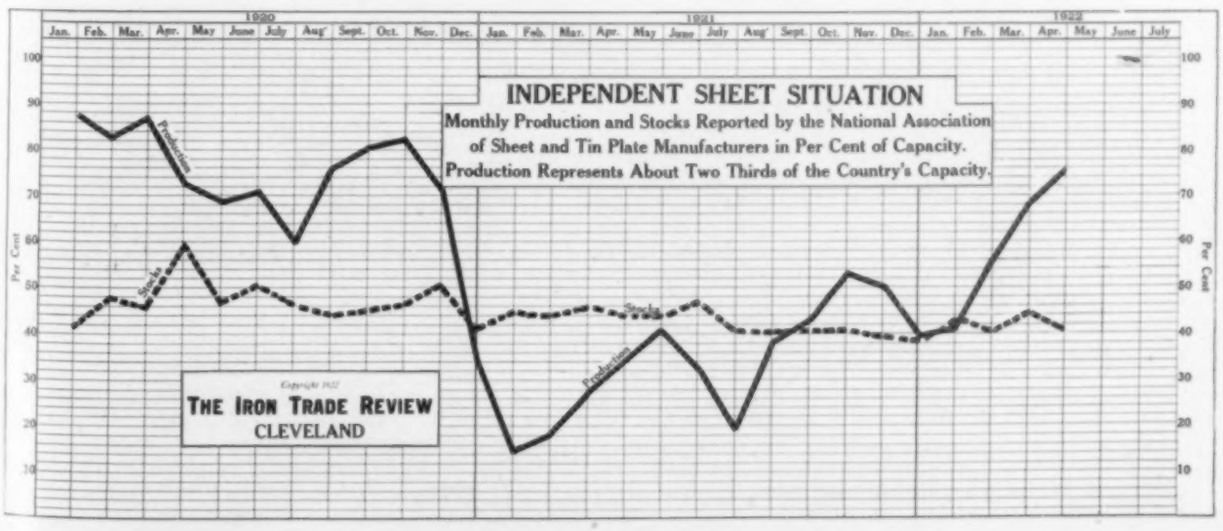
CLEVELAND
Pound Sterling
Par Value
Pound Sterling
Par Value
Pound Sterling
Reserve Board Index
FOREIGN EXCHANGE
Federal Reserve Board Index of monthly average rates for 18 countries
Monthly British Sterling Rates in Per Cent of Par
Per Cent


INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by the National Association of Sheet and Tin Plate Manufacturers in Per Cent of Capacity.
Production Represents About Two Thirds of the Country's Capacity.
Production
Stocks
Stocks
Production
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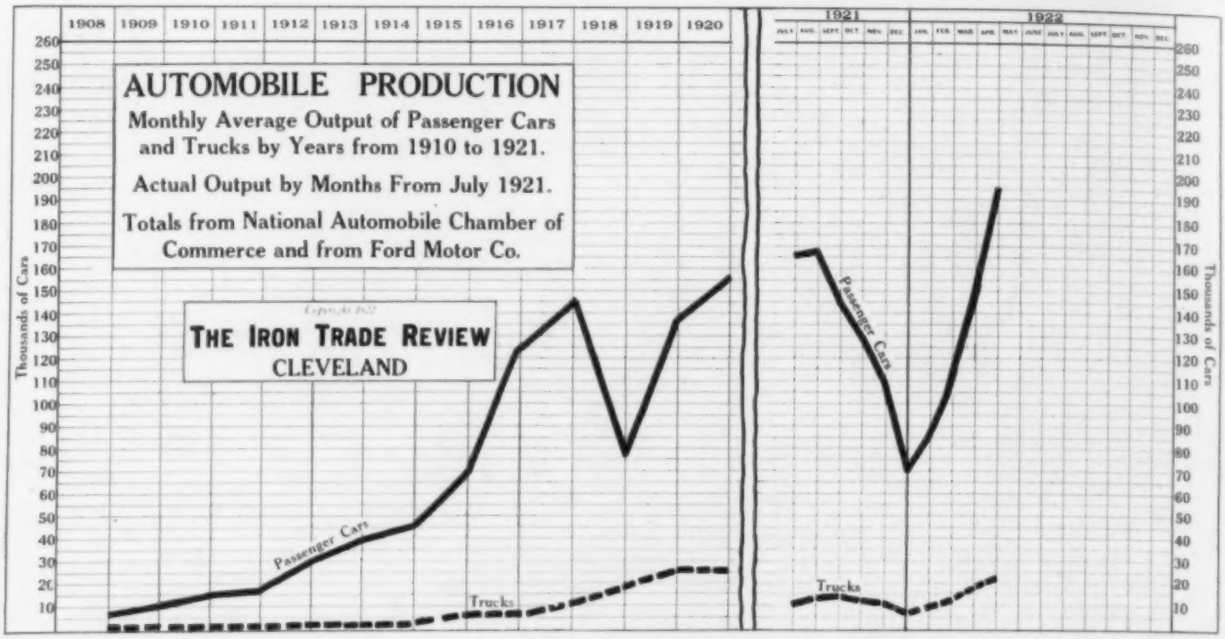
THE IRON TRADE REVIEW
CLEVELAND
Per Cent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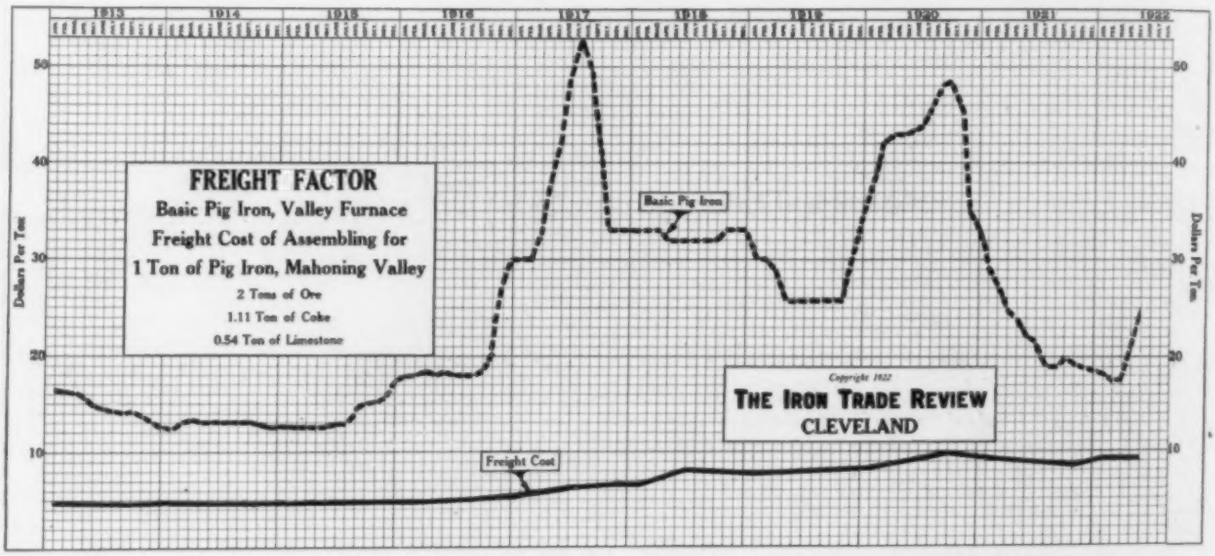
Actual Output by Months From July 1921.
Totals from National Automobile Chamber of Commerce and from Ford Motor Co.
THE IRON TRADE REVIEW
CLEVELAND
Thousands of Cars
Passenger Cars
Trucks
1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920
1921
1922


FREIGHT FACTOR
Basic Pig Iron, Valley Furnace
Freight Cost of Assembling for
1 Ton of Pig Iron, Mahoning Valley
2 Tons of Ore
1.11 Ton of Coke
0.54 Ton of Limestone
Dollars Per Ton
Basic Pig Iron
Freight Cost
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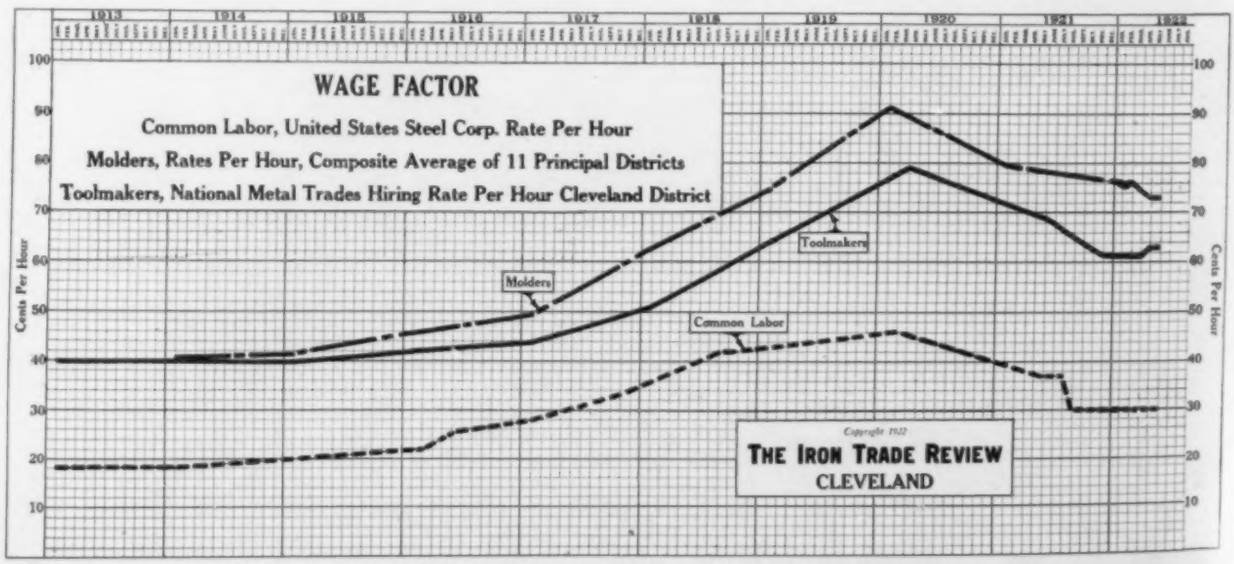
WAGE FACTOR
Common Labor, United States Steel Corp. Rate Per Hour
Molders, Rates Per Hour, Composite Average of 11 Principal Districts
Toolmakers, National Metal Trades Hiring Rate Per Hour Cleveland District
Cents Per Hour
Molders
Toolmakers
Common Labor
THE IRON TRADE REVIEW
CLEVELAND
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Thousands of Cars
Cents Per Hour

Railroad Decisions Are Helpful

Reductions of Wages and of Rates Attack One of Greatest Obstacles in Way of Real Prosperity—Horizontal Rate Cut Not Scientific but Should Stimulate Traffic—Loan to Germany Looms as Europe Improves

BY JOHN W. HILL, FINANCIAL EDITOR

JUNE, the final month of the first half of 1922, opens under auspicious circumstances in the financial and industrial world. Constructive developments which have been steadily accumulating since the beginning of the year have brought business safely through the preliminary stages of recovery. Recent events have given such additional impetus to the momentum of revival that visible signs of actual prosperity already are becoming apparent.

Two of the most imposing barriers to fulfillment of prosperity hopes have been the excessive freight rates and the European financial tangle, revolving about the reparations problem. For that reason the reductions of railroad rates and wages and the meeting of international bankers in Paris to survey the possibilities of a loan to Germany are developments of far-reaching significance.

The lowering of freight rates by 10 per cent has brought the rate level down to about 65 per cent above the prewar basis. The chief criticism of the interstate commerce commission's action is that the rate adjustment was not made by commodities. As a result of the horizontal reductions, rates are lowered on light traffic of high value where freight charges are not a deterrent factor. On the other hand, rates on the bulky low priced commodities such as iron and steel, coal and building materials, where the transportation factor is a large one, are kept relatively high. For that reason the undeniable stimulus to business given by the reduction will be less pronounced than it might have been had the interstate commerce commission handled the matter on a more scientific basis. In view of the fact that commodity prices are rising, most buyers probably will find it more profitable to take shipments at current prices and rail rates, rather than to wait for the rate cut on July 1.

Even railroad executives, themselves, believe that traffic will be stimulated as much by the removal of the uncertainty as by the lower rates. With the new wages for maintenance of way employes the roads are said to be prepared to proceed with important improvement programs calling for the employment of at least 200,000 additional men.

Momentous events are impending in Europe. J. P. Morgan is meeting with other leading international bankers in Paris to discuss a loan to Germany. That country has agreed to all terms and provisions of the reparations commission provided a loan is extended under "bearable terms." The bankers necessarily must consider reparations and seek a workable plan which will allow Germany to become a good credit risk. Practically all underlying indications, however, point unmistakably to the economic recovery of Europe. This is the testimony of the present cautiously advancing exchange rates.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One month ago	One year ago	1913
Business failures	....	459	543	400	300
Cash Ratio Fed. Res. system	77.5	77.6	78.3	57.6	.....
Loan rate, 4-6 months, N. Y. (per cent)	4¼	4¼	4½	6¾-7	5¼-5½
Aver. 20 Ind'l. shares	$91.85	$91.46	$88.66	$72.73	$78.25
Aver. 20 Rail. shares	$85.69	$84.94	$83.86	$71.94	$107.50
Aver. 40 bonds	$80.14	$80.25	$80.46	$69.33	$93.00
Car loadings (week ended May 13)	777,359	755,749	706,713	750,800	*755,000
Bank debits 165 cities (000 omitted)	$8,767,179	$8,930,421	$8,829,131	$7,192,804	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	May 20 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.44	$4.44	$4.42	$3.88
Francs	19.3c	9.10c	9.06c	9.18c	8.27c
Lira	19.3c	5.23c	5.06c	5.30c	5.22c
Marks	23.8c	0.33c	0.33c	0.35c	1.59c

*Monthly average export prices. †March.

MONTHLY COMPARISON

	April	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$353,192,000	$293,636,000	$220,886,000	$71,450,000
Business failures: Number	2167	2463	1487	1336
Liabilities	$73,000,000	$71,600,000	$38,567,769	$22,723,000
Excess of exports	$104,000,000	$74,000,000	$85,885,000	$54,406,000
Excess of gold imports	$10,630,000	$32,502,000	$80,279,000	*$630,716
Bureau of Labor Price Index	157	152	154	100
Bradstreet's Price Index	145.2	126	123.5	100
Economist's British Price Index	4285	4297	4929	2717
Cost of Living Index	154.8	154.7	167.6	100
New incorporations	$792,372,000	$731,866,000	$987,894,000	$172,301,000
Railroad net earnings	†$83,570,000	$46,000,000	$30,807,000	$59,900,000

Lack of Credit Depresses Prices

Japanese Iron and Steel Business Is Handicapped by Financial Conditions—Buying Falls Off 50 Per Cent—Steel Stocks Increase—Government Steel Works To Greatly Enlarge Pig Iron Output

Special Correspondence

TOKIO, Japan, May 17.—The situation in the Japanese iron and steel trade has become worse owing to the inability of buyers to obtain credit. Prices are declining, especially those of sheets and nails.

Toward the close of April statements concerning bankers' accounts disclosed that their credits were frozen and that liquidation was necessary for them to remain in business. Conditions bordering on panic prevailed for a time in the stock market but liberal help from the Bank of Japan prevented a serious crisis. Every line of business here is handicapped by the credit situation and the iron and steel trade particularly is overshadowed.

Buying in the iron and steel market is falling off steadily. In the iron trade business at present is less than 50 per cent of the average at the beginning of April. Average daily sales

Yen—$0.47

in the steel market at present are only 40 per cent of what they were a fortnight ago. According to a report of the warehouse association here visible stocks of pig iron on April 22 amounted to 207,100 tons, a decrease of 2230 tons since April 15. The government steelworks plans to increase its production of pig iron this year by 40,000 tons to 400,000 tons. According to a dispatch from Shanghai, the Hangyeping Iron & Coal Co. will relight a furnace at Taya soon.

A report just issued shows that on March 7 stocks of steel in Japan amounted to 126,530 tons, an increase of 31,587 tons in a month. Stocks have been increasing since then, principally the stocks of black sheets and tin plate.

Prices are somewhat lower. No. Japanese pig iron is 70 yen ($32.90) per ton, although the same grade from the Hokaido furnaces can be obtained at 65 yen ($30.55). No. 2 Japanese is quoted 65 yen ($30.55); No. 3, 60 yen ($28.20); No. 1 Hangyang, 64 yen ($30.08); No. 3 Cleveland, 78 yen ($36.66), and Indian iron, 60 yen ($28.20).

In the steel trade round bars have been reduced to 4.70 yen ($2.21) per 10 kwamme; flat bars to 5.20 yen ($2.44); square bars to 5 yen ($2.35), and sheets to 7.30 yen ($3.43) per 10 kwamme. Plates remain at 4.50 yen ($2.11) per 10 kwamme. Nails are held at 12.50 yen ($5.87) per keg but buyers will not pay more than 11.30 yen ($5.31). A kwamme is the Japanese unit of trade and represents 8.2773 pounds.

Prices Maintained on Strength of Export Trade

European Staff Correspondence

BIRMINGHAM, Eng., May 18.—The foreign market is opening up in a very encouraging way, Scotland having sold quantities of steel bars to South America, South Africa and Japan, while Birmingham also has been an important center for export business.

It is probably too much to expect an extensive relighting of furnaces under present circumstances. The New Westbury Iron Co., Ltd., has started a furnace in Wiltshire, after a long period of idleness, for the production of basic iron, and it is understood that the product has readily sold at fairly satisfactory prices. The Cardiff-Dowlais steelworks, owned by Guest, Keen & Co., is preparing for an early re-start of a blast furnace. An order for 5000 tons of rails has been placed with the company by a railway in the South of England.

The pig iron industry is being sustained by export trade. May shipments are holding up to the record for April, Germany still being a good buyer. A great deal has been heard of American inquiry for pig iron, and reports are a little contradictory as to the actual amount of business resulting therefrom. In the Cleveland district those who should be well informed state that the American business merely has been a continuance of the shipments of special pig iron, ferromanganese and spiegeleisen which ordinarily are good lines with America. Your correspondent, however, has been personally assured by a large firm of merchants handling the Cleveland business that they have shipped to the United States four 1000-ton lots from Middlesbrough, in addition

Sterling $4.45

to one 1000-ton lot from a Midland center. Several Midland merchants have received inquiries, but in nearly every case the cost of transit to the coast has put the business beyond the range of possibility for Midland furnaces.

The tone of the market is good. The maintenance of prices has been a surprise to those who have held back orders in expectation of lower offerings. Cleveland makers say they would prefer to blow out their furnaces rather than cut prices. The engineering stoppage has not prevented the negotiation of a certain amount of business by consumers who see indications of coming advances. Against this must be set the suspended deliveries by idle firms which see no possibility of consuming pig iron supplies on order. The financial stress is so severe just now that a great many users cannot afford to buy material.

The West coast still is managing to dispose of its product although that district suffers probably as seriously as any from the labor trouble at consuming plants. Nearly all furnaces in operation are producing hematite or ferromanganese, and a large proportion of the output is consumed by the local steel mills, foreign buyers taking the remainder, except for small quantities consigned to the Midlands, South Wales or Scotland. While the Glasgow pig iron ring still is holding regular meeting no business is transacted.

In the steel trade the most significant feature is the maintenance of prices. Manufacturers are impressed with the striking American improvement reported in THE IRON TRADE REVIEW'S cablegrams, and are inclined to be envious of the large business in structural and railroad material.

Sheffield seems to be suffering the worst effects of the engineering stoppage. Most of the firms have decided not to make an attempt to do business until work can be done with reasonable prospect of peaceful labor conditions.

Export inquiries for iron and steel continue encouraging. Scotland will get an immediate benefit from the recent resumption of work at the shipbuilding yards, while Scandinavia and the East are placing better orders. The tube trade is under great difficulty in its export department owing to the keenness of German, Canadian and American competition, although a fair quantity of tubes are being sold to home customers.

Birmingham appears to be an important center of business just now. One merchant claims to have sold 7000 tons of pig iron for export, while business with India is practically continuous. This concerns Belgium. Continental steel is no more effective than it has been in the British market. But two or three merchants find that in shipments to India they can save considerable amounts by getting the material sent away from Antwerp. One merchant says he saved £1 16s 2d ($8.04) per ton by selecting Belgian material. Keen discrimination is made in regard to requirements, certain classes of steel of British origin being preferred.

Another development is a series of

Current Iron and Steel Prices of Europe

British Market

Home Market Prices. Gross Tons at Works or Furnace or F.o.b.

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	32.26	7 5 0
Sheet bars	32.26	7 5 0
Wire rods	42.28	9 10 0
FINISHED STEEL		
Steel bars, England, ⅝ to 3-inch	41.16	9 5 0
Steel bars, England, ¾ to 3-inch, for export	37.83	8 10 0
Plates, ship, bridge and tank, England	42.28	9 10 0
Plates, ship, bridge and tank, England, for export	40.05	9 0 0
Plates, ship, bridge and tank, Scotland	42.28	9 10 0
Plates, ship, bridge and tank, Scotland, for export	37.83	8 10 0
Beams, England	42.28	9 10 0
Beams, England, for export	37.83	8 10 0
Beams, Scotland	42.28	9 10 0
Beams, Scotland, for export	37.83	8 10 0
Sheets, black, 24 gage	47.28	10 12 6
Sheets, galvanized, 24 gage	71.20	16 0 0
Rails, 60 lbs. and over	35.60	8 0 0
Rails, 60 lbs. and over, for export	33.38	7 10 0
Tin plate, base box, 108 lbs.	4.34	0 19 6
Steel hoops	48.95	11 0 0
Steel hoops, for export	45.61	10 5 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	21.14	4 15 0
Hematite, West Coast, Mixed Numbers	21.92	4 18 6
Basic Middlesbrough	18.91	4 5 6
No. 3 Foundry, Middlesbrough	20.03	4 10 0
No. 3 Foundry, Derby, Leicester, Nottingham	18.36	4 2 6
No. 3 Foundry, Northamptonshire	17.24	3 17 6
No. 3 Foundry, Staffordshire	18.36	4 2 6
No. 3 Foundry, Scotch	20.58	4 12 6
Ferromanganese, 76 to 80 per cent	66.75	15 0 0
Ferromanganese, 76 to 80 per cent, for export	63.42	14 5 0
COKE		
Yorkshire furnace	4.23	0 19 0
Yorkshire foundry	6.68	1 10 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	23.17	6435
Foundry, No. 3, Oberhausen	21.13	5870
Bessemer Stahleisen, Siegen	20.88	5800
COKE		
Ruhr furnace	4.71	1308
Ruhr foundry	4.88	1355
SEMIFINISHED STEEL		
Billets	32.09	8915
Sheet bars	30.49	8470
Wire rods	29.77	8270
FINISHED STEEL		
Standard rails	39.60	11,000
Merchant bars	35.32	9810
Structural shapes	34.69	9635
Ship plates	39.60	11,000
Medium plates, 3 to 5 millimeters	45.09	12,525
Sheets, below 3 millimeters	47.66	13,240
Tin plate	100.80	28,000
Plain wire	36.00	10,000
Bands and strips	39.49	10,970

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	30.08	330
Basic Bessemer, Lorraine	20.97	230
Foundry, Longwy, No. 3, sand-cast	20.51	225
Foundry, Longwy, No. 3, chill-cast	20.97	230
Ferromanganese, 76 to 80 per cent	90.24	990
COKE		
French furnace	9.30	102
German furnace, f.o.b. frontier	8.20	90
French foundry	11.85	130
SEMIFINISHED STEEL		
Blooms	29.17	320
Billets	30.99	340
Sheet bars	33.73	370
FINISHED STEEL		
Standard rails	50.13	550
Merchant bars	39.20	430
Angles	43.30	475
Normal beams and profiles	43.30	475
Plates, ship and tank, 10 millimeters and thicker	53.78	590
Plates, bridge and tank, 5 to 10 millimeters	58.34	640
Sheets, black, 3 millimeters	65.63	720
Sheets, blue annealed, 2 millimeters	82.04	900
Shafting, cold-drawn, 40 to 60 millimeters	77.48	850
Bars, 2 per cent nickel steel	100.27	1100

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	18.97	225
Basic open-hearth, Belgian	20.23	240
Gray forge, Belgian	18.13	215
Foundry, No. 3, Belgian	19.81	235
Foundry, No. 3, Luxemburg	20.23	240
Foundry, No. 3, Lorraine	20.23	240
SEMIFINISHED STEEL		
Blooms	26.13	310
Billets	27.40	325
Sheet bars	28.24	335
Wire rods	39.62	470
FINISHED MATERIAL		
Standard rails	33.30	395
Merchant bars	33.72	400
Normal beams and profiles	32.03	380
Plates, 5 millimeters and thicker	39.20	465
Sheets, black, 3 millimeters	40.89	485
Sheets, galvanized, 1 millimeter	107.48	1275
Plain wire	50.58	600
Galvanized wire	67.44	800
Wire nails	37.51	445

All prices are f.o.b. furnace or works.

orders from Thames barge builders for iron and steel required for building and repairing vessels.

The scrap market is decidedly improved and there are signs that war material is at last disappearing. A large Welsh buyer who some time ago insisted on £2 17s 6d ($12.79) as the highest price he was prepared to pay has found it necessary to buy at £3 5s ($14.46) for the same material. For wrought iron scrap the present offers are £3 10s ($15.57), but sellers show no inclination to rush their material on the market owing to their belief that it will increase in value.

Steel billets are firm at £7 12s 6d ($33.92) delivered in Birmingham. Some makers claim to be getting £7 15s ($34.47) to £8 ($35.60). The question of steel prices is being considered a great deal in South Wales were the quotation still continues at £7 7s 6d ($32.81) for tin and sheet bars. The Welsh steelmakers have completed a plan under which a uniform price will be charged for semifinished steel delivered at all consumers' points of the Welsh area. It is considered likely that the system will be extended to Birmingham which regards South Wales as its principal source of supply. Finished bars continue firm at £9 10s ($42.27). Some firms demand £10 10s ($46.72).

Firmer Tone in Welsh Tin Plate Trade

European Special Correspondence

CARDIFF, South Wales, May 17.—There is evidence that the improvement in the Welsh tin plate trade is of a substantial character. Manufacturers, however, say that production is still being carried on at a loss, an instance is a case recently where a sum of £3000 ($13,250) had to be taken out of the "pool" to retain a big order for oil plates which otherwise would have gone to America.

Sterling—$4.42

Prices are firmer. Stocks in con-

(*Concluded on Page* 1583)

Asks Effort To End 12-Hour Day

Judg E. H. Gary Tells Men of Iron and Steel Industry Question of Hours of Work Per Day Should Be Settled Decisively and Without Prejudice —Field Marshall French Is Guest of Honor

GET rid of the 12-hour day if you can" was the theme of Judge E. H. Gary's opening remarks in convening the spring meeting of the American Iron and Steel institute at the Hotel Commodore, New York, last Friday. Judge Gary described at considerable length the developments at the dinner at which President Harding acted as host, at the White House, May 18, to more than 40 members of the institute. While a good many faithful accounts of what happened were published in the newspapers after the dinner, Judge Gary said, a good many unjustified suggestions also were printed in connection with the dinner.

"It was a very simple, homelike dinner and the steel industry has no reason to complain of the attitude shown by President Harding," said Judge Gary. "The speakers included nearly all the guests of the evening and the speaking was done by the gentlemen while sitting in their chairs. President Harding believed that this method would be more cordial and homelike and that it would induce freer discussion. I told him that the gentlemen in the iron and steel industry would have no difficulty in expressing themselves while on their feet, whereupon President Harding replied that his suggestion had been made somewhat in self-defense.

Informal Discussion at White House

"The President said he had not prepared anything beforehand but that he wanted to talk and hear talk about the 12-hour day. He said he believed that there was a growing opposition throughout the country to the 12-hour day, and he thought that the 12-hour day in the iron and steel industry should be eliminated if it were possible to do so. This could be done, he said, only by concerted action of all of the companies. The President said he did not desire to interrupt or disrupt or in any way embarrass the steel industry but he thought the 12-hour day ought to go, if possible. 'That,' he said, 'is as far as I go. If I can help to bring about this change that has been demanded in certain directions it would be very agreeable to me.'

"We told President Harding that the iron and steel industry first of all appreciated the invitation of the President of the United States to discuss a question of so much public interest and which was of so much vital concern to the industry itself. We told him it was the desire of the industry to get rid of the 12-hour day if it were practicable and desirable from all standpoints. We told him that the men who did hard and burdensome work in the steel industry do not work over eight hours, and that the men who work 12 hours are not engaged in actual labor more than half of the time. We told him that the 12-hour men, who are mostly foreigners, earn the largest sum practicable, and the amount of pay in the pay envelope is of the highest importance to the men themselves. We told him we knew of the public expressions against the 8-hour day, many of which were by individuals not well informed. We expressed our desire to meet the wishes both of the public and of the workmen if and when it seemed possible to do so. Some of our speakers called attention to the fact that this question was largely one between the workmen themselves and the public which paid the extra costs of production arising from the decreased hours of labor. We said we intended to be open-minded and fair-minded.

Authorize Investigation Committee

"The President comprehended that there were difficulties, yet he showed signs of being in dead earnest, and that he relied upon us to bring about the change, if possible. It was moved by one of the steel gentlemen and carried that a committee be appointed by the president of the American Iron and Steel institute to secure data and ascertain facts as to the attitude of the men themselves and of the general public and report their recommendations to the institute. It first was thought that his committee should have five members, but it since has been the feeling that this should be a committee of nine in order that all branches will be represented adequately. The committee must be fair, just, intelligent and representative. There must be no effort to establish a committee prejudiced for or against the 12-hour day."

Judge Gary asked that each company in the iron and steel industry submit its views on the 12-hour day to this committee. He said that these views should be in written form, fit to print, and that they be signed by the highest offices of each company. The question of the 12-hour day should be settled definitely, he said, and no ground left for anybody to assail the iron and steel industry. This investigation, he said, must be undertaken with a determination in advance of finding ways of getting rid of the 12-hour day if this can be done. It is much easier to find a way not to do a thing than it is to find a way to do it, unless one sets out with the idea of doing it, said the judge.

At the request of Judge Gary, the members of the institute stood in silence for a minute in memory of the late Dr. Henry Marion Howe, to whom Judge Gary referred as "our beloved comrade and distinguished associate of world-wide fame, and an honorary member of this institute." Judge Gary commented on the magnificent attendance at this and other meetings of the institute. "It is only men of fine instincts, of superior thought," he said, "who can enjoy such friendships as yours, and your ability to convene in large numbers in an order manner is the effect of the experience and trained minds of gentlemen."

Following his extemporaneous remarks on the subject of the 12-hour day, Judge Gary proceeded to read his prepared address, which appears elsewhere in this issue.

The committee to examine the question of abolishing the 12-hour day was announced as follows, after the directors of the institute had discussed and agreed upon the matter at their noon meeting: Chairman, Elbert H. Gary; Charles M. Schwab, James A. Farrell, Willis L. King, A. C. Dinkey, James A. Campbell, James A. Burden, L. E. Block and John A. Topping.

Technical Papers are Discussed

The usual notable array of papers featured the technical part of the institute's program. These papers are set forth elsewhere in this issue. The paper on "Industrial Housing," by C. L. Wooldridge, was discussed by R. H. Stevens, chief engineer of the Midvale Steel & Ordnance Co., Philadelphia; Paul C. Kuegle, manager of the Buckeye Land Co., subsidiary of the Youngstown Sheet & Tube Co., and Walter C. Riley, vice president of the Indiana Homes Co., subsidiary of the Inland Steel Co. The paper on "The General Effect of Electrification of Steel Mills Upon Their Operations," was discussed by D. M. Petty, superintendent of the electrical department of the Bethlehem Steel Co., Bethlehem, and R. W. Cousins, electrical engineer of the Gary works of the United States Steel Corp. Francis L. Toy, superintendent of the open-hearth department of the Homestead plant of the Carnegie Steel Co., discussed the paper on "Methods of Using Fuel in Open-Hearth Furnaces," by Herbert F. Miller Jr., and M. J. Devaney, superintendent of the open-hearth department of the South Chi-

rage works of the Illinois Steel Co., discussed the paper on "Gas and Air Valves for Open-Hearth Furnaces," by W. C. Bulmer.

At the organization meeting of the directors, E. A. S. Clarke, president of the Consolidated Steel Corp., was elected treasurer of the institute to succeed Edward Bailey who has retired from this office as well as from the directorate of the institute. Other officers were re-elected as follows: President, E. H. Gary; vice presidents, Willis L. King, Charles M. Schwab and John A. Topping.

Field Marshall, the Right Honorable, the Earl French of Ypres was the guest of honor at the banquet Friday evening. Judge Gary introduced the distinguished soldier with a stirring description of the great odds the marshall encountered early in the war and of the superlative way in which he met them and prevented the armies of the central powers from winning the war at that time. Field Marshall French responded with an address in which he expressed his gratitude for the warm reception that has been accorded him in this country, and he voiced his appreciation of the great services of this country, and of our iron and steel industry in helping to win the war. Marshall French characterized the United States as a nation of fighters. He said that nothing less than a nation of fighters could have done what this nation did during the war.

A feature of this portion of the program was the frequent allusion by Marshall French to the United States Steel Corp. He referred to the United States Steel Corp., and the "Steel corporation of the United States" in such a way as to permit deduction that the Marshall, perhaps, when thinking of the steel industry in this country had only one steel company in mind. Following his address, Judge Gary said he thought Marshall French believed that "we are all in one family."

"We would be very proud of that if it were true," said the judge, "provided it were legal. There are, of course, a great many other, very prosperous, powerful, steel companies in the United States. Through the medium of the institute, of course, we were one big family in supplying war materials for the gallant troops of the marshal."

Paints Word Picture of Future

Dr. John S. Unger, research engineer of the Carnegie Steel Co., made an address at the banquet in which he boldly outlined a dream as to how the steel industry would develop in the future. The height of the ordinary blast furnace, he said, will be reduced from 100 to 25 feet, and this 25-foot furnace will pour iron continuously instead of being tapped at intervals as at present. The hot-blast stove, he said, will disappear altogether; the blast furnace of the future will be a comparatively simple affair. He said the car dumper principle is going to be applied to ore vessels. Unloading ore boats in six hours, good as this unloading time is under present methods, he said, soon will be "old-fashioned." The boat of the future, he said, will be run into a dry-dock, turned upside down, the ore dumped out and in 30 minutes the boat will be on her way back up the lakes for another load of ore. A coke plant using 14,000 tons of coal every 24 hours now is a tremendous plant, he said, and the present method of transporting this coal by the barge-loads is an expensive one, he said. In the future, he said, the coal will be pulverized at the mines, pumped in suspension in water through 8-foot pipes to the destination, and the water drained off. Seamless tubes are going to be blown in the future in the same way that glass is blown, but, as steel has different physical characteristics, it will have to be blown in an oven. Slabbing and blooming mills for breaking down ingots are going to be done away with, Dr. Unger said, and steel products will be produced by the extrusion process now used in connection with lead and other nonferrous metals.

Sees Future Substitute for Steel

When the teeming millions of China and of other countries throughout the world use steel in the same quantities as the inhabitants of the United States, said Dr. Unger, half a million tons of steel will be consumed every 24 hours. At this rate of consumption it will not take long to exhaust our reserves of high grade iron ore. The present-day steel then will be replaced, he said, by an alloy of aluminum, silicon and iron. Tests recently made show that such material can be made to have a strength equal to that of the steel now used as building material. This material is difficult to reduce, he said, but processes are going to be developed in the future which will bring about the replacement of our present day steel by combinations of silicon and aluminum.

Willis F. McCook, president of the Pittsburgh Steel Co., delivered the closing address of the evening. He spoke of the danger of erecting class against class in this country. He spoke of the circumstances under which the Adamson law was passed and he mentioned the farmers' bloc and other examples of the tendency toward class consciousness in this country. Anyone, he said, who stimulates class or religious hatred is a traitor to his country, and he appealed for an awakening to the dangers in the struggles between classes.

Scrap Activity Waning

(Continued from Page 1528)

of heavy melting steel, 2150 tons of wheels, 26 scrap locomotives and 23 tenders.

Busy on Old Orders

Buffalo, May 29.—Scrap dealers still are engaged principally in filling old orders in the face of a strengthening market. Heavy melting steel is firm at $16.75 to $17 and it is difficult to do much under $17. All grades are firmer. Mills are buying steadily but are compelling shipment strictly according to specifications. The market for No. 1 busheling and mixed borings and turnings is strong, the borings price now being $12.50 to $13. Production improves except for turnings.

Steel Shows Strength

Cincinnati, May 29.—Heavy melting steel is the particular feature of strength in the scrap market, having advanced another $1 a ton while a few other grades have been marked up fractionally. Steel mills in the Pittsgurgh district recently have been taking large quantities of heavy melting and there is a growing demand for that grade from other sources. Four railroads whose tonnage usually finds its way to this market are expected to issue lists this week. Manufacturers in this district are increasing their scrap output.

Softening Appears

St. Louis, May 29.—The scrap market has lapsed into a period of quietness. The industries have withdrawn, and with offerings by dealers freer, the tone is decidedly easier, though no marked revisions in price lists were made. The bearish aspect has been further emphasized by an embargo against shipments by the American Steel Foundries Co. and the Laclede Steel Co. Other melters have about all they can accommodate in their storage space. Heavy melting steel was a half point lower, and some of the steel specialties, which have been the strong spot in the market for several weeks, are showing signs of weakening. Opinion as to the effect of a 10 per cent cut in rate schedules on the market is divided. The only railroad lists before the market were one of 5000 tons by the Louisville & Nashville and 5200 tons by the Chicago, Burlington & Quincy.

Better Conditions In South

Birmingham, Ala., May 29.—Better conditions in the scrap market are noted and dealers are beginning to feel a better demand. Heavy melting steel is moving as well as cast and other products except wrought. Quotations have changed only a little lately. Stocks are in good shape and any and all demands can be met.

More than 51 per cent of the holders of the capital stock of the Johns-Pratt Co., Hartford, Conn., have accepted the offer of the Colt's Patent Fire Arms Mfg. Co., of that city to buy their stock at 275 a share.

Let Government Study Business

Country's Big Industries Should Be Subject to Nonpartisan Inquiry and Investigation —Take Tariff Out of Politics—Sales Tax Would Be Fair Assessment Basis—Abandon Bonus Now—Business Outlook Cheerful

BY E. H. GARY

PROSPERITY and welfare of all the people depend upon the enactment, the administration and the enforcement of law. It furnishes the fundamental distinction between human beings of today and the cave dwellers of the past. All fair-minded, right thinking men and women will agree that laws should be adopted, maintained and enforced strictly on the basis of equal opportunity and equal responsibility to every man, woman and child, wherever located and whatever the surrounding circumstances may be. Any law in its existence or administration that discriminates in favor of or against any individual, calling or location is essentially wrong and is injurious to the whole body politic. Any person who, for selfish reasons or as an advocate for another, insists upon a claim contrary to the one expressed is disloyal to the principles of our national scheme of government.

These principles should always be borne in mind by the executive, the legislative and the judicial departments of government; by the farmer, the merchant, the banker, the carrier, the manufacturer, the miner, the employer, the employe, the possessors of capital and the impecunious; and in these days particularly they should be constantly emphasized in the minds of all professionals—those who attempt to instruct or to minister to the wants of others.

Should Guide Industry

I trust we of the iron and steel industry are conscious of our obligations to the laws of the land, to the general public and to our neighbors, those with whom we come into business contact. This should be our constant thought and study. This is a substantial part, nay, the controlling spirit of this institute. On the other hand, we have the right to insist that all others shall be required to conform to the same strict accountability; and that we shall receive the same protection and benefits that are accorded to others. As the prosperity of the country is vitally affected by the passage and administration of laws, even by the tinkering of legislation, so called, it is deemed appropriate to discuss before the business men of an important manufacturing industry some of the current proposed legislation, even though what we may say or think may have little influence.

FROM the mere view of successful operation, perhaps most of us might admit that private business can be better managed by the owners without any public interference or oversight, though there are two sides to this question; but if conceded, it seems to me to be fair and reasonable that big business, with all its advantages and power, should be subjected to governmental inquiry and supervision, provided it is through a nonpartisan, nonpersonal, thoroughly qualified commission, and shall always be subject to review and determination on the merits by the highest judicial tribunal. The courts of our country are the bulwark of protection and safety. They are able, impartial and honest. They may be assailed, even as righteousness itself may be assaulted, but, if so, with exceedingly rare exceptions, it is because they are worthy and the man who attacks is unworthy. By his very actions or words he is self-condemned.

Revision of tariff laws is an intermittent disease. It appears, if not with every session of congress, certainly with every change of administration. It seems to be considered an important political question, though it ought not to be. It should be discussed and decided strictly upon scientific principles and from the standpoint of fairness to every part of the country, to every department of human industry, to every line of employment and to the public welfare. This was the tendency of public discussions for a time, but it seems there has been an increasing departure from this practice; that the data secured by the national tariff commission at large expense has been almost completely ignored in late discussions.

As between parties the main difference, as I see it, is that the republican party has stood for a "protective tariff" and the democratic party a "tariff for revenue," whatever the distinction may be or is claimed to be. The settlement of this controversy should include both. Indeed, if the question is settled right there must be both. The evil, if any, results from going to extremes. If the two parties could agree upon principles, as they ought to do, the tariff question would be removed from politics, and business progress would not be disturbed by pending legislation relating to it.

Tariff rates should be high enough to protect all producers in this country, including capital and labor, against destructive foreign competition, which may come from cheap labor or otherwise, and might drive both domestic capital and labor out of employment. They should protect domestic production fully up to the point of being on a parity with all foreigners as to selling prices in the United States; but they should not be high enough to permit producers to oppress consumers by unreasonable and unconscionable prices.

The determination, from time to time, of this basis, that is, the full and fair application of the principle stated, would involve careful and scientific study and be more or less difficult, but it would not be political. There should be a commission of well paid, high minded, intelligent, competent and non-partisan appointees, authorized to ascertain and communicate the facts and figures, and their reports should be frequent so that, if deemed necessary, a change in or amendment to the tariff laws or any of them could be made at any time congress is in session. Its members would or should confine their discussions to the question as to whether or not the recommendations came within the principles named.

Should Be Fair, Reasonable

Fair and reasonable protection to industry, no oppression to the consumers, this is the line to be established and maintained up to the highest point of possibility. To this principle I think we may safely and conscientiously subscribe. For its application good business will lend its influence.

We have able, fair minded men in congress and they are not afraid to vote against tariff rates they believe are too high or too low. It is to be hoped the tariff agitation now pending will soon be ended and that the bill adopted will not especially help or hurt either political party, and that it will help business.

Legislative enactments for the regulation of industry are being frequently debated in and out of congress and, personally, I welcome this in so far as

Presidential address before the American Iron and Steel institute, New York, May 26.

it is sincere, unselfish and nonpartisan. Almost as a matter of course the majority of individuals or associations if they themselves are exempt and unmolested, are quite willing and even anxious to have all others subjected to the most rigid governmental investigation and exposure to the public. Investigation and publication are proper and desirable, if not carried to excess. Constant, partisan and reckless indulgence in this pastime by representatives of government, or, what is much worse, by self-appointed, unqualified or dishonest individuals or associations, posing as public benefactors, may be and often is misleading and antagonistic to the general welfare.

We may concede that searching inquiry is sometimes necessary and generally productive of good and still be justified in characterizing many of the investigations and investigators as a public nuisance, especially if there is an attempt to go beyond the legitimate domain of the examination, and more particularly, if misrepresentations or unfair methods are indulged in.

Favors Reasonable Publicity

When it comes to our industry or any other important branch of economic activity, as you know, I have always favored reasonable publicity. I know some of you may believe I have gone too far in my expressions of opinion upon this subject, but I have endeavored to look to the future and to consider the question from all sides and from the standpoint of the best interests of all.

Insistence that governmental regulation of industry is proper and desirable should always be accompanied by the condition that there shall be no discrimination; that all lines and departments of economic activity of similar importance shall be subjected to the same treatment. The progress and prosperity of no nation can long endure if any single factor in economic life shall be especially favored or punished or exempted. Equality before the law is fundamental. The consideration of mere personal and private benefit or injury to any single factor in our industrial life, has no proper place in the genius of our nation.

The thoughts suggested arise from the disposition during the last few years to pass laws which measurably exempt labor organizations, and recently farmer associations, from governmental investigation, supervision and control against wrong. Not only are they exempted from certain restrictive provisions of the existing statutes, but they are affirmatively permitted to do certain things prohibited as to others.

If it is necessary, in order to protect workmen against imposition, to permit them to organize into associations and thus act collectively, let it be done under and by virtue of the general laws, subject in management to governmental investigation and supervision and control against wrong, oppression and violence. Let them account, under direction of the government, for moneys received and disbursed. And the same argument applies to farmers. Treat all persons, all organizations, of equal importance, as essential parts of a nation, each as good and as bad as the others.

TO PERMIT labor associations or farmer organizations to do, as the result of combination, things that are claimed to be beneficial to them which are denied to others is to create classes, to favor some of them and to injure the whole body politic. It tends to array class against class, and it adds to the cost of production. And be it remembered the general purchasing public, in the end, must pay the bills. This, as a net result, is certain. This is not equal opportunity and equal obligation. I willingly admit as to labor, towards which no one has better intentions than I, that in the long past, as the result of class existence, it was not justly treated. Also, I know by experience and otherwise, that the farmers, the most essential element of our national life, have not uniformly received adequate financial returns on their investment and labor. I was born and bred on my father's farm. I was a laborer in the true sense, both as to hard work and long hours.

Governmental regulation of industry, in my opinion, will never be a satisfactory and permanent success unless and until it is fair and reasonable and, above everything else, is applied without discrimination.

For many months there has been much discussion relating to a bonus to those who served in the late war. There has been considerable propaganda in behalf of this proposal. The people of this country, for the present at least, cannot afford to pay or appropriate the large bonus for soldiers which has been suggested. The burdens of taxation resulting from the war are already too heavy to carry without materially and adversely affecting the full return to prosperity. There should be, right now, extensions and new developments of enterprise in many directions; but delay or abandonment is made necessary for lack of ready money on account of taxation.

Former soldiers, like all others, need opportunity to work in any and all lines of employment and, to continuously furnish this chance, courage and capital should be given to industry. The load of taxation ought to be lightened, not increased. Enterprise has staggered under this burden. It would not be difficult to break its back. These are not idle words. They are a solemn warning, not only to soldiers, but to everyone who is at present seeking what is neither reasonable nor patriotic; also to any who claim from the government what it is not able to pay without increasing the national debt.

If and when there is paid a bonus to soldiers the amount should be provided by a species of taxation which is universally distributed. More than this, I think, in accordance with principles already referred to, all taxes should be assessed and collected in proportion to benefits derived and the ability to pay. This is represented by the possession of property or the expenditure of money.

Sales Tax Fair

The fairest method of taxation is found in the sales tax, so called. It is the most easily, cheaply and certainly collected. It has been found in other countries to be practicable, satisfactory and successful. The tendency is to make persons more economical and saving. The sales tax is just because it leaves to everyone the opportunity to decide what the amount shall be over and above actual necessity. It is less difficult to collect large amounts and works less hardship to honest people because it is so widely distributed. A cent each to 20 men is twice as much as 10 cents to one man. Under the present income tax laws the cost of collection is unreasonably large, and many who are able to pay escape.

I verily believe with a fair sales tax business would be better, the country would be more prosperous, individual opportunity increased and everyone made happier. Every plan which is just and applies in due proportion to all the people, in benefits or obligations, is likely to be the most satisfactory and to build up the nation on a sound and safe foundation.

It is hardly necessary, if proper, to refer to possible legislation relating to the payment or cancellation of the sums due our country by foreign nations. For the good of both creditor and debtor all honest debts should be paid, if possible, though a generous and humane creditor will always be liberal in extending the date of payment in times of urgency.

Since the armistice of 1918 I have never spoken publicly without referring to the signs of danger and depression,

(*Concluded on Page* 1593)

Present Papers Before Institute Meeting

DAVID BAKER

FRANK J. NASON is a geologist and mining engineer with headquarters in West Haven, Conn., and the author of technical books and papers and popular novels. He was born in New London, Wis., May 12, 1856; was graduated from Amherst college in 1882; was instructor in mathematics in Rensselaer Polytechnic institute for five years and then began a career as geologist and engineer. He became assistant geologist in New Jersey in 1888 and a year later was made state geologist. In 1890 he went to Missouri as assistant geologist and two years later to British Columbia where he managed a zinc and iron ore placer mining plant. Mr. Nason in 1898 was made superintendent of the Mt. Wilson Gold & Silver Mining Co., Mt. Wilson, Colo., which position he held until he became consulting geologist for the Derby Lead Co., the Central Lead Co. and the Guggenheim Exploration Co. in 1900. Then for three years he was consulting engineer of the Ringwood Iron Co. since when he has been engaged in consultation work for the United States Steel Corp. He has also been engaged in consultation work with the New Jersey Zinc Co., the Jones & Laughlin Steel Co. and Witherbee, Sherman & Co. Mr. Nason is a fellow in the Geological Society of America and a member of the American Association for the Advancement of Science, the American Institute of Mining and Metallurgical Engineers, and other organizations.

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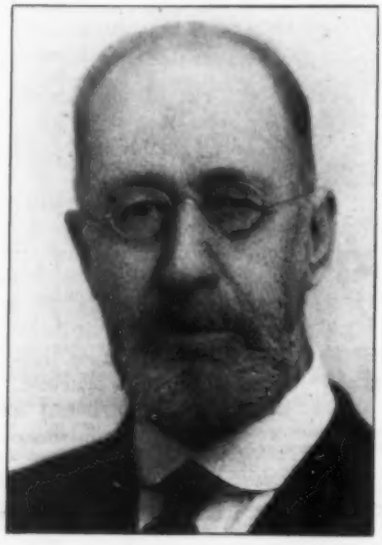

FRANK J. NASON

WILLIAM C. BULMER was superintendent of the open-hearth and bessemer steel department of the Ohio works of the Carnegie Steel Co. at Youngstown, O., until June 1 when he took charge of the sales and installation of water cooling appliances made for open-hearth furnaces by the Blaw-Knox Co., Pittsburgh. Mr. Bulmer started as a machinist's apprentice at the Ohio works, then the National Steel Co., in 1887, when he was 16 years old and had been employed there intermittently up to June 1 this year. He was given charge of locomotive repairs in 1901, was made machine shop foreman in 1902 and resigned in 1903 to return to school. He was graduated in 1909 from the University of Michigan and then started again at the Ohio works, this time as an efficiency engineer in the steel department. Two years later he resigned to become master mechanic for the American Steel Foundries at Franklin, Pa. Mr. Bulmer resigned there in 1913 and returned to the steel department of the Ohio works and three years later was made superintendent of the department.

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DR. LOYAL A. SHOUDY

DR. LOYAL A. SHOUDY has been chief surgeon of the Bethlehem Steel Co. since 1919 and was surgeon for the company for five years previously. He went to the Bethlehem company in 1914 following a year each at the Mary Drexel and the Lankenau hospitals, both in Philadelphia. That was after his graduation from the University of Pennsylvania in 1909 with the degree of M. D. In 1904 he was graduated from the University of Washington. Dr. Shoudy is vice president of the Industrial Surgeons of which he formerly was a director and is chairman of the committee on standardization of first aid, representing the National Safety council, of which he has been a director, the Industrial Surgeons and the Conference Board of Physicians.

WILFRED SYKES

Give Industry Benefit of Research Work

HERBERT F. MILLER JR. is assistant superintendent of the Lackawanna Steel Co., Buffalo, to which position he was promoted in September, last year, after four years as open-hearth efficiency engineer for the company. For a year preceding that he was works superintendent of the Hewitt Steel Co. to which he went after two years as assistant superintendent in the open-hearth department of the Sparrows Point plant of the Bethlehem Steel Co. Mr. Miller began his industrial life in the Homestead works of the Carnegie Steel Co. in June 1908 where he remained until he became superintendent of the open-hearth department of the Verona Steel Castings Co. in 1911. Two years later he was made superintendent of the open-hearth department of the Sweets Steel Co. from which he resigned in 1914 to go to Sparrows Point. He was graduated in 1908 from Harvard university.

* * *

DAVID BAKER is consulting engineer in charge of construction and manager of the steel plant of the Broken Hill Proprietary Co., Ltd., at Newcastle, N. S. W. For 20 years Mr. Baker has maintained metallurgical connections internationally although he is a native American, having been born in Boston in 1861. He took charge of the blast furnaces of the Pennsylvania Steel Co. after his graduation from the Massachusetts Institute of Technology in 1885. For 10 years to 1897 he was in charge of the erection and operation of blast furnaces of the Maryland Steel Co. and for the next year served as metallurgical superintendent of that company. In 1898 Mr. Baker went to the South works of the Illinois Steel Co., remaining there four years. He then became general manager of the Dominion Iron & Steel Co., at Sydney, N. S. After three years there he went to Philadelphia where for eight years he practiced as a consulting engineer. Since then he has been with Broken Hill.

* * *

CHARLES L. WOOLDRIDGE is general superintendent of the Carnegie Land Co., Pittsburgh, in charge of the housing operations of the Carnegie Steel Co. Mr. Wooldridge was selected by the United States Steel Corp. to design and build the housing development in connection with the proposed Neville Island ordnance plant which was stopped by the termination of the war. Mr. Wooldridge was educated in the University of Pittsburgh and then began his industrial career which included three years as superintendent of the Allegheny works of the Pressed Steel Car Co.

* * *

WILFRED SYKES is assistant to the operating vice president of the Steel & Tube Co. of America, Chicago. When he appeared before the institute in October 1919 he was in charge of the marine and steel mill work of the general engineering department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., with which he became associated in 1909. He was born in New Zealand and was educated in the Technical College of Melbourne, Australia. He had been with the Allgemeine Elektricitate Gesellschaft both at Melbourne and in Berlin, before coming to the United States, and previously had been associated with Knox, Schlapp & Co. and Shoerker & Fischer, both of Melbourne. He is regarded as an authority on electrical equipment.

Authors' Papers

Papers presented for discussion before the institute, and their authors, were as follows:

"The Development of the Iron and Steel Industry of Australia," by David Baker.

"The Relation of the Doctor to the Steel Plant," by Dr. Loyal A. Shoudy.

"Industrial Housing," by C. L. Wooldridge.

"The General Effect of Electrification of Steel Mills Upon Their Operation," by Wilfred Sykes.

"The Importance of the Iron Ores of the Adirondack Regions," by Frank L. Nason.

"Methods of Using Fuel in Open-hearth Furnaces," by Herbert F. Miller.

"Gas and Air Valves for Open-hearth Furnaces," by W. C. Bulmer.

WILLIAM C. BULMER

CHARLES L. WOOLDRIDGE

HERBERT F. MILLER JR.

Doctors Healing Industrial Ills

Plant Physicians Promoting Good Will Between Employes and Company, Instructing and Leading Men—Provide Means for Sympathetic Contact with Individual—A Treatise on the Human and Economic Aspects of "the Case"

BY DR. L. A. SHOUDY

FOR many years it has been the custom in mines and plants to have available a group of men whose duty it is to be on hand when "something goes wrong," commonly known as the "monkey wrench gang," the "bull gang" or the "repair gang." The men may come from the electrical department, from the mechanical department or any other department, though their function is the same, to repair. These men are generally so placed because they are good, quick and thinking workers, men who can "fix up" the broken machine and get the works going so as not to interfere with production.

Now, the doctor in the plant also runs a repair shop. He and his "gang" are repairmen for the human machine. I have been a steelworker for seven years, and I have seen wonderful plants built, cranes, engines and machines placed, the utmost of engineering skill used in designing and placing, and all to the end of an efficient producing plant.

From the manager's point of view, he has a wonderful mechanical equipment, but how much thought has been given to the real running of those machines? How much thought to the real guidance that production may reach the desired peak?

From the engineer's standpoint all is well. But how much thought has been given to the men who are to man the machines? Have your engineers looked them over? Have you seen to it that these human machines are in good working order? If you look them over, do you place them accordingly? The greatest raw product that comes to your plant, the greatest machine you purchase, is the man. Do you treat him as such?

The doctor as a steelworker is comparatively a new institution. The doctor as the old-type of company doctor, the type whose duty it was to care for those maimed, is not new. In days past his work did not include what is now termed medical supervision. It is not my intent to go into the history of the company doctor but rather to explain how he should function and his relation to the plant.

A few years ago many of you doubted the wisdom of admitting a doctor to your steel family, and I know that the doctor has had to prove his right to be included in your family. You have always looked upon the doctor as someone apart from real work and have never considered him as being able to help in the manufacture of steel.

The doctor's repair shop must be a place where the injured men are glad to go. It must be so conducted that the men will feel confident that they will receive the best of care. To quote:

"The all-day medical repair shop is a great melting pot for human experience. Here the virtues as well as the weaknesses of men are reflected. The right man in charge becomes both priest and physician, confessor and adviser. How necessary, therefore, that one secure a man not only of high professional attainments but one of broad social vision. A cheap doctor like a cheap machine will produce a cheap result and no man will recognize that cheapness sooner than your workmen."

Need for Proper Equipment

Now when you men build you build the best and you give your superintendent the best working facilities. Let me ask you to so equip your doctor. You own the blast furnace, the open hearth, the rail mill; then why not own or control the doctor's workshop, the hospital, or at least a part sufficient for your needs, and equip it according to your needs? An industrial hospital properly handled by men understanding industry should prove of untold value in developing good will between the men and the company.

You would not think of employing an open-hearth superintendent on part time, why employ a part-time doctor? You need his undivided thought and attention just as much as you need the open-hearth superintendent's time. Select the right man and pay him, make him feel he is a part of your steel organization and let him be proud of his position. Medical work is not a charity; it should never be considered as a charity or welfare. It is a part of your plant, a part of your production and helps in your profits in proportion as you develop and use it. Before long you will be called upon to define and compensate occupational disease. Why not prevent? You conduct laboratories of steel research, why not clinics of health research? Why not make men as well as steel?

The conditions under which the doctor works and the things he does are important. His sympathy for men and his insight into the understanding of their problems are sure to reflect credit upon him and his profession.

You may now limit your work to accidents, when sickness causes you the greatest loss of time. Why not prevent sickness? Why not have a complete medical service with the best of medical advice? The industrial doctor learns the language of the shop, he has a common bond with the man. He knows the man and his job.

You shy at physical examination. In some states it must be done in some form in order to protect you from buying a defective machine. I believe that some day you will agree and find it a profitable plan to examine all the machines you purchase and profitable for you to keep these machines in good repair, and profitable to place them according to the work they can do.

Periodical re-examination will keep your men fit. When a man once knows that you are interested in his health and are sincere in helping him he will more than welcome your plan. Fitting the man to the job and not the job to the man, should be the work of the plant doctor. Certain men will produce more in certain lines and when the foreman once learns that the doctor is a real help he will be for him. The fitting of men to the job is a big problem and can only be solved by the co-operative work of the employment manager, the doctor and foreman.

I believe Mr. Schwab is responsible for the phrase "work with, no work for." If any man should "work with," it is the doctor. He works with the men, cheerfully, carefully ably and cares for the small wounds

Paper presented at the meeting of the American Iron and Steel institute, New York, May 26. The author is chief surgeon, Bethlehem Steel Co.

in the same thorough manner as the last ones. He never misses an opportunity to talk to the men about their jobs and their health. He teaches them to appreciate that health is the rightful heritage of every man and woman, the greatest gift of life, greater even than youth.

Doctor and Foreman Co-Workers

From the operative standpoint you view the foreman as the keyman for production. The doctor and the foremen must be friends and co-workers. When talking to foremen I always drive home the importance of their position; that the reason they are selected is because they are leaders of men, and that if they are to be good foremen they must be for men. They should understand the doctor and work with him and know that when a man in their gang is not up to the mark to look him over, talk to him, and if he needs repairs to send him to the doctor.

Foremen and superintendents in large plants are first of all concerned with production, but I have yet to find in our plant a superintendent or foreman who at heart is not interested in his men. This interest is worth more than all the relief and compensation you can pay. If the worker knows that his boss thinks of him in time of injury or need his feeling for his job and for his boss cannot be expressed. And it is a part of the doctor's work to stimulate this and bring it about. Foremen are good at heart, only they need a heart stimulant now and then.

It takes time to change and to educate men. The gangs are so large, the class of men so varied that to the average foreman the individual is lost, the name never known. It's work to be done and "damn you, do it."

The average foreman does not know, feel or care for Petro or Mike; he does not know that Tony has a sick wife and baby. Tony is injured; he meets the doctor. "Mr. Doctor, my baby, my baby, no got milk, no got eat; my wife, she no got eat, me no more good, no more work. Mr. Doctor, you do something." If your doctor is right, here begins Tony's introduction to the foreman and to the plant. "Sent to the hospital," the wife is told, taken to the hospital to see him to assure her he is still her living Tony. Tony is cared for surgically, placed in a clean bed, the nurse smiles, everything is pleasant.

From the plant doctor's office goes a note or telephone to the foreman that Tony's condition is good. Tony's department superintendent is told. Tony's buddies drop in to see Mr. Doctor and learn that Tony is doing fine.

At the hospital Tony is really Tony, not a "case"; he is cared for by a company surgeon who talks his language and knows his will, a real man cared for at company expense in a cheerful room with pleasant surroundings; his wife treated with consideration and allowed to see him. Tony, through the doctor, is given messages about the plant. The foreman receives notes as to Tony's progress and to him Tony becomes a human being. Visiting nurse calls, sees that milk is left for the baby and wife.

At the hospital through kind handling and proper surgical care, through a process of making over, Tony is supplied with artificial hand and leg and taught to use these before he leaves, taught a new job where he can make a living. He is saved from the human scrap heap and becomes a real member of the family, with a feeling for the company he cannot express.

There are many Tonys in the steel industry and there are many foremen who need to know that they are in their gangs.

The doctor becomes more than a repairman to human machines; he becomes a teacher, he leads the foreman to see the needs of his men, shows him that coughs and ruptures are capable of being repaired, stimulates in him a pride in having a good healthy gang of men and that the condition of his men reflects on him because good men will do more and better work.

Accidents of some sort will always happen. The safety engineer has done much to lessen the number of severity. The doctor and safety engineer must work "hand in hand." From the doctor's talk with the injured man he learns many facts which are invaluable in the work of prevention. The cause may be in the workman himself.

In days gone by we were wasteful of much material that is now saved. Economic conditions have wrought changes. The scrap heap is worked over; new products from by-products. There are economic reasons for the presence if the doctor in the plant, and with some employers these reasons outweigh all others. But they should never be the reason uppermost in the mind of the physician himself.

You should select your doctor with as much care as you select your superintendent or general manager. Select a doctor who has a high idea of the importance of his work, who has a real feeling for his fellowman and an understanding and vision of men and work. The doctor who does not see that his profession leads beyond the care of the bodies of men into their moral and mental health is not living up to his opportunity and duty, and especially is this true of the industrial doctor.

Promoter of Good Will

I believe that to no other man is given as great an opportunity to promote a better mutual understanding and relationship between employer and employe as is given the doctor. The doctor in the plant should understand the workings of the plant, he must at all times work in harmony and co-operation with the various departments. He must understand men.

The steel industry has become so large, the number of men employed so great, that the employer sees the worker only in mass. The plant doctor's "vision must be so clear, his sympathy so great, his sense of justice and fair pay so keen, that however great the mass, he never loses sight of the individual.

Sometimes a man is unhappy for psychological reasons. The relations between him and the men about him are not congenial; the relations between him and his foreman are a constant source of irritation. The doctor knows that right mental conditions are just as important for the welfare and efficiency of a man, and that they have as much to do with output and profits, and are deserving of as much attention as physical conditions. You know mental ailments need treatment. Harsh words, sarcasm from a foreman or superintendent, give to the doctor his hardest jobs. Fears of all kinds, discontent, lack of a living wage, worry over sickness or trouble at home, worry over debts, over a love affair, over bad habits, and innumerable other stimulti for mental and physical depression are daily arising to undermine the health of employes, and it is as essential to remove these conditions as it is to tie up a cut finger.

Sickness and injuries are company liabilities. The right doctor with the right surroundings can turn them to company assets, assets that cannot be measured in dollars and cents. Man is a machine, human as against mechanical. Iron or steel will not stand up under constant use and neither will man. He must be oiled and repaired occasionally, his habits changed at times and steered into another track. This he will not do of himself until the breakdown comes

(Concluded on Page 1554)

Mill Electrification Progresses

Recent Years Have Witnessed a Number of Large Installations of Motor Drives on Rolling Mills—Operation Results Are Satisfactory—Power and Motor Size Not Limited—General Plant Layout Discussed

BY WILFRED SYKES

ONLY about 30 years ago was electricity first introduced into steel plants for motive power purposes, and for many years it was a small factor, being used only in places where mechanical drives were difficult, such as traveling tables, cranes, etc. Later, due to the experience gained with such applications, it was used for other auxiliary purposes around the mills, again mainly on account of convenience, and while good results were obtained, development lagged due to the lack of suitable apparatus. However, when enough mills were interested in the subject to make it profitable for manufacturers to build special equipment for the severe operating condition, a rapid improvement took place, which added greatly to the reliability of these auxiliary drives.

When we discuss the main drives, perhaps there is not a clear understanding as to the reasons for the replacement of the steam engine. In the case of the auxiliaries, questions of convenience, reliability, and easy maintenance are important enough to justify the use of motors, even if the operating costs were considerably more than they actually are; but in the case of the main drive, the steam engine has apparently operated as well as desired, and due to a long period of development, it has reached a stage where it gives reliable operation, when properly designed for mill service.

Conversion Loss Is Small

Electrification is due fundamentally to certain inherent characteristics of the generation, distribution and utilization of electricity. The conversion of the output of the prime mover into electricity is accomplished with a loss that seldom exceeds 5 per cent with modern equipment. Perhaps the greatest economy of electric drive is due to the small loss with which this form of power can be distributed and the fact that the loss varies with the load so that the lines can be kept charged ready to supply power as demanded and loss only occurs when power actually is being used. Even at full load the loss in the lines seldom exceeds 1 or 2 per cent.

To convert the electrical energy to mechanical work we must use motors. The efficiency of a continuously running motor under the varying conditions of load will usually average well over 90 per cent. In the case of a reversing mill, which involves first the conversion of electricity from one form to another and then into mechanical work as well as providing for equalization of the peak loads, the overall efficiency from the switchboard to the mill coupling will run over 75 per cent.

Electric Mills Efficient

In any discussion of economy we must be careful to distinguish between theoretical figures and actual operating results, as what we are interested in is the overall efficiency from the energy in our gas or coal to the mill coupling during a month's or a year's operation and the only teacher of any value is experience. The best measure is our power cost per ton of material shipped. Complete electrically-driven mills show decided advantages when this measuring stick is applied to the question.

As a matter of interest, are given a few figures of two reversing mills in our plant, one being the reversing blooming mill and the other the reversing universal plate mill. The former rolls ingots 20 x 22 inches, weighing 7300 pounds to blooms averaging about 6 x 8 inches for the billet mill, and ingots 16 x 38 inches and weighing about 10,500 pounds to slabs for the plate mill. The plate mill rolls the slabs from the bloomer to skelp for the pipe mills, a typical range of which is given as follows:

Kind of mill	Gross tons of ingots or slabs rolled	Kilowatt-hours per ton, main drive only	Power cost per ton, main drive only
Blooming mill.	444,510	16.2	17.8 cents
Plate mill.....	191,524	31.9	35.1 cents

Average coal cost per ton at boiler house during year = $5.07.
Gas charged for at coal price on basis of equivalent evaporation.

Closely connected with the subject of economy is the question of mill layout. The facility with which electricity can be distributed relieves us of the necessity of considering power distribution and mills can be arranged in the best possible manner for operation without having to face any disabilities on the score of power economy. To sum up, with a central station we manufacture our power wholesale and through a cheap distributing system we deliver it to the consumer as required. If the mill does not require power, it does not have any losses to take care of.

The statement is sometimes made that electric drive is more expensive than a steam drive. This is doubted when a true comparison is made of all the factors that must be taken into consideration, such as boiler plants, steam distribution, water distribution, sewers and many other items that affect the total cost of the plant. Too frequently, in discussing this question, comparisons neglect important items which, while difficult to estimate, must be considered.

Size of Motors Increases

If electrification did not offer advantages, it is hard to understand why it has been so extensively adopted in recent years. In the accompanying curve is shown the growth of the horsepower of motors used for driving main rolls in units of 300 horsepower and above and it will be seen that the total is approaching a million horsepower. The curve indicates the increase in popularity of this form of drive as experience is gained.

The rapid extension of steelmaking and finishing capacity in recent years would indicate that in the immediate future the problem will be not so much extensions, as a rehabilitation of the older plants to enable them to operate with such efficiency as to be competitive, and this will require careful consideration of electrification as a means to this end.

Before leaving this phase of the subject, it is well to point out that the necessity of generating electricity for auxiliary purposes, requires stations of substantial output. The following table illustrates this point and shows the power used for main drives and for auxiliary purposes at the Mark plant during the year 1920. It will be seen that if the mills were driven by engines, a large proportion of the total

From a paper presented at the New York meeting of the American Iron and Steel institute, May 26. The author is assistant to operating vice president, Steel & Tube Co. of America, Chicago.

power would have had to be electrical in any case.

Mill	Main drive only, kilowatt-hours	Auxiliary purposes, kilowatt-hours
Blooming mill	7,061,000	5,040,000
Plate mill	6,111,000	2,967,000
Bar mill	2,920,000	1,890,000
Skelp mill	7,700,000	.....
	23,792,000	9,897,000

	Kilowatt-hours	Per cent
Total power generated.....	53,428,000	....
Consumed, main drives....	23,792,000	44.5
Consumed, mill auxiliaries.	9,997,000	18.5
Consumed, other parts of steel and coke plant.....	19,639,000	37

Leaving the general characteristics of electrification some of the more important questions that interest the executive and operator will be answered. The first question that is asked regarding any method of driving mills is whether it will enable us to get the desired output? This is not only a question of the amount of power available but of the characteristics of the driving unit and the subject must be considered in relation to the different types of mills.

In the case of a mill running continuously in one direction, there are practically only two points to be considered. The first is the power, the second is the speed characteristic. As far as power is concerned, any output required by our mills presents no unsolved problem to the motor designer. Much larger motors than any individual mill is likely to need have already been built. Probably the highest rating of any machine driving a continuously running mill is that of the motor driving the 160-inch plate mill at Gary, Ind. This motor is nominally rated at 7000 horsepower, but to meet the particular specifications, it actually has a continuous capacity of about 9000 horsepower. In operation this machine frequently carries peak loads up to about 18,000 to 20,000 horsepower.

The largest electric motor that has been built to date has a continuous rating of 22,500 horsepower or more than twice the capacity of the 160-inch plate mill motor and there is no particular reason why larger machines could not be constructed if there was any demand for them. As far as power is concerned, it is only a question of determining how large the motor should be. It is fortunate that the electric motor has a practically constant high efficiency over a large range of load, varying usually not more than ½ to 1 per cent from one-half to full load, and also that the power station is so flexible that, if a machine is too large for the immediate requirements, the net effect on efficiency is practically negligible. It happens frequently that it is difficult to specify operating conditions definitely and it has been the author's experience that it is wise to be liberal in choosing the size of motor.

Regarding the speed characteristics, the ordinary motor tends to run at a practically constant speed independently of the load. Where a flywheel is used, the object is to assist the motor in carrying short time peak loads. For instance, in the case of a plate mill, the early passes may require four to five times the power of the motor for a fraction of a second. It can be arranged readily that the motor will take a certain proportion and the flywheel supply the remainder. When the passes become longer, the peaks are reduced and the motor then carries a greater proportion of the load. By the proper interaction of the motor and the flywheel, an economical balance is obtained. The speed characteristics of the mtor usually are varied by means of the control equipment and they can be adjusted readily to suit individual operating conditions. In the case of mills where the passes are long, the flywheels are of less value and it is frequently desirable that the speed remain practically constant, which is the inherent characteristc of the motor. Therefore, we have the possibility of either maintaining the speed constant within two or three per cent or of regulating it to give the best operating results, depending on the load condition.

Sometimes the characteristics of constant speed enable us to obtain greater output as compared with an engine which usually does not hold its speed so well under heavy load; and in some cases it has been stated that the mills have an output of 5 to 10 per cent greater when electrically driven. In this connection it should be remembered that the ordinary mill motor can carry double load for short periods without any particular sacrifice of efficiency or any great change of speed.

Rolling Time Is Small

More discussion has arisen regarding the motor-driven reversing mill in comparison with the steam engine drive than of any other type and this is natural, as the motor is an invader in the field for which the engine seems to be particularly well adapted. Quickness of maneuvering and ease of speed control is of the utmost importance for a successful drive. This will be appreciated when it is realized what a comparatively small percentage of the time the metal is in the rolls. An analysis made of a number of steam and motor-driven mills shows that in the case of a blooming mill operating rapidly, the metal is in the rolls about 30 to 40 per cent of the total time of rolling and from 60 to 70 per cent of the time is required to handle the steel. A casual observation of the mill does not reveal this, but it is surprising how closely well operated mills approximate to the same figures.

Much discussion has been provoked regarding the ability of the motor-driven mill to turn out tonnage and if an analysis is not made of the operation, one can be deceived readily when observing steam and motor-driven mills in operation. A motor-driven mill appears to maneuver slowly but a closer observation shows that it is operated in a different way than the engine-driven mill, due to the fact that its speed can be more accurately controlled. Observation of operation frequently leaves the impression that the motor-driven mill is not doing much work, due to the absence of noise or other indications of action. Actual records, however, show that the motor can give a good account of itself.

At the plant of the Trumbull Steel Co., Warren, O., is installed a 36-inch blooming mill which rolls ingots 20 x 22 inches, weighing 6700 pounds to 6¼ x 6¼-inch bloom in 13 passes. This mill has rolled 60 ingots in one hour and the operators feel that this figure can be improved.

Perhaps a better indication of the speed with which a motor can be handled is given by the machine driving the roughing stand of the 84-inch tandem plate mill of the Brier Hill Steel Co., Youngstown, O. The following show a 12-hour and 24-hour record, it being seen that there is little difference between the 12-hour and 24-hour figures:

	Length of run 12 hours	24 hours
Number of slabs.....	1659	3270
Number of passes in roughing mill	7	...
Total charged weight, tons.....	373	715
Total finished weight, tons.....	315	518
Maximum number of slabs for one hour	220	...
Finished tons of 10, 11, 12 and 14 gage U. S. standard.....	23	71
Finished tons of 8 and 9 gage...	13	435
Finished tons of ⅜-inch, No. 10 gage	26	6
Finished tons of ¼-inch and heavier	253	6

It will be seen that this mill averages, over a 12-hour period, about 16 passes a minute or less than 4 seconds per pass, which takes in all delays due to any cause. This mill has been in operation since September, 1919, and the performance has progressively improved as the men became familiar with the best methods of operation.

A third illustration, taken at our plant, is that of a universal plate mill which has rolls 30 inches in diameter and can roll universal plate up to about 46 inches wide. It is used for rolling skelp for the pipe mills and the material is on an average small for this size of mill. During the month of March, 1920, this mill turned out 23,014 gross tons of material. The gage was fairly light

and the width not the best to secure maximum tonnage. The delays were appreciable, which was due to the necessity of waiting for steel at times, roll changand minor troubles. This does not represent the limit of capacity of this mill and if necessary it could probably be boosted up to close to 30,000 tons per month by the addition of more heating furnace capacity and perhaps the elimination of some of the sizes which are entirely too small for this mill.

If we are satisfied with the possibility of rolling a desired tonnage, the next question is whether the equipment will operate continuously or at least with no more delay than encountered with steam drive. Here again the best answer

TOTAL HORSEPOWER OF MOTORS OF 300-HORSEPOWER AND OVER USED FOR MAIN MILL DRIVES IN THE UNITED STATES.

is experience. Below are given figures from one or two mills which show the actual results obtained. The first electrically-driven reversing drive to be installed in the United States was that of the 30-inch universal plate mill in the South Chicago plant of the Illinois Steel Co., which was put in operation in 1907. It was designed about the same time as the first equipment in Europe and went into operation a few months later. The electrical engineer was attempting to solve an entirely new problem with little data and no experience, and later developments have shown that many of its constructional details could be improved materially. However, the history of this pioneer installation is of interest as it illustrates that even with an entirely new problem the time lost due to changes or breakdowns has not been serious. The major delays of this mill have been as follows:

Nov. 10, 1907.—Mill shut down for one week to correct armature cross connections.
Oct. 14, 1908.—Mill shut down to try out spare generator armature which had been purchased.
Sept. 12, 1909.—Change of generator armature due to grounded coils.
Oct. 24, 1909.—Generator armature changed due to some bars becoming unsoldered.

A novel design of generator was tried out in this installation but has not been used in subsequent jobs; and this accounts for the particular troubles that caused the above delays.

In March, 1913, the Steel Corp. of Canada put in operation a 34-inch electrically-driven blooming mill. This equipment embodied a number of important changes from the general design used for the Illinois Steel Co.'s mill and some control features which at that time were novel. A few days were lost, when the mill was first started up, in making a number of changes in the control. No particular effort was made to save time, as at that period the output of the mill was not urgently required. During the last six years the total delay charged by the blooming mill department against this equipment has been about 12 hours and a detailed analysis of these figures show that only about two hours have been due to delays caused by the equipment itself being down for any reason. These delays were made up of a few minutes at a time required to change a contact on a switch or some such minor matter, the remainder of the time lost being due to such causes as interrupted power supply, etc.

Another example is the 35-inch blooming mill at the Mark plant. This mill was put in operation in April, 1918, and has run continuously to date. The total delay charged to the equipment is about 12 hours, the major part of this being due to interruption of power supply. Only a small part of the delays have really been due to the inability of the drive to operate the mill, perhaps not more than an hour or so. Such times that the mill has had to be shut down for electrical troubles have been made up of periods of a few minutes at a time for correction of minor difficulties involving adjustment of control equipment.

A factor in which our operators are particularly interested is operating labor. Most mills feel that their larger and more important drives, such as reversing mills should have an attendant present to watch them, mainly as a precautionary measure. In the case of continuously running mills, there has been enough experience to show that this is not necessary and now it is customary for one man to inspect a number of machines and to take the usual meter readings for the mill record. When an operator is employed continuously to look after a drive, the usual practice is to put substation equipment under his control, as it is generally convenient to install converting apparatus in proximity to the main drive. These men have little to do outside of occasionally looking over the machines and taking meter readings.

Electrical machinery requires maintenance as well as any other equipment. With intelligent electrical superintendents most of the expenditure is of a precautionary nature and repairs due to breakdowns become a small item. In going over the figures of plants where freedom from breakdown is characteristic it would seem that for motors from 2000 to 3000 horsepower we should spend perhaps $200 to $250 per year to keep them in condition. The cost will vary somewhat with the number of equipments the force has to look after, as with a larger plant the cost per machine will average less than in a smaller mill.

Referring to the physical condition of the reversing mill of the Illinois Steel Co., which has been in operation since 1907, the commutators of the reversing motors show about 1/16 inch wear and the commutators of the generators show a wear of about 1/16 inch for each five years of service. This would indicate a life for the commutator of the motor of about 180 years and for the generator about 60 years. The windings are in apparently about as good a condition as when first installed. At the end of 10 years some wear of the motor generator bearings was noticeable and as an insurance, spares were purchased, but have not been installed, as in the last five years there has been no appreciable wear. The original motor bearings are in use and apparently will last indefinitely.

Another example illustrative of the long life of electrical equipment when given good care is the case of the 2000 horsepower motors driving the light rail mill at South Chicago. These machines were installed in 1906 and after about 14 years of service the company thought it would be a good precaution to rewind them. A careful inspection by the manufacturer revealed no apparent deterioration and the recommendation was not to disturb them.

In building a modern plant we have the choice, in most localities, of

purchasing power from a public utilities company or of building our own power plant. When we have sources of heat which would otherwise be wasted, this is usually sufficient reason for building our own plant. Public utilities, however, in many cases can make rates and give assurance of continuity of supply which make their power attractive. Any modern power plant would only be built with alternating current units, as direct current involves too much expense for the distribution of large powers and has limitations from a generating standpoint.

In general, we have a choice of two pressures, 2200 or 6600 volts, either of which can be used directly with motors for main drive. Experience has shown that if the distribution problems are not too serious, 2200 volts should be chosen, as the machines for this pressure are much freer from insulation troubles than those for 6600 volts.

Two frequencies are in use in the United States, 25-cycle and 60-cycle. In the early days of electrification, when it was thought that most generators in the mills would be driven by gas engines and that the motors would be directly connected to the rolls, the 25-cycle system seemed to be the logical one to adopt. At that time, the means of connecting the higher speed motors to mills were not satisfactory. Since then gearing and other mechanical features have been materially improved, so that the great majority of mills installed today use moderate speed motors geared down to the mill speed. The 60-cycle system has grown rapidly in favor during recent years and for main roll drive with proper connections is quite as satisfactory as the 25-cycle system.

A further advantage is that the large power systems, which are gradually spreading over the country, are practically all 60-cycle and it is probable that in the future mills will find it profitable and desirable to purchase at least some of the power used. The 60-cycle system has a number of advantages as a greater range of motor speeds is obtainable and the machines are lighter and cheaper. The perfection of 60-cycle converting equipment, which was not available a few years ago, has materially changed the situation. The type of prime mover has an influence on the frequency adopted. For the ordinary sized plant, the general practice today is to build a turbine station, generating current at 2200 volts, 60 cycles, which is distributed direct to the mills.

Underground Cables Recommended

In the older plants most of the distribution is overhead. This is somewhat cheaper in first cost than that of placing all cables underground, but it is not nearly as satisfactory. The best system is to use insulated lead covered cables laid in ducts embedded in conduit which run to the different consuming or distributing points. A great many of these ducts can be grouped together to run in such a way as not to interfere with any of the other parts of the plant. This leaves yards entirely free from overhead obstructions. The use of an underground system eliminates all danger from lightning disturbances.

For substation equipment we have the choice of either motor-generator sets or rotary converters. The tendency is to use rotary converters, as they are lower in first cost and much more efficient. Motor generator sets give us the possibility of using substation equipment to improve the power factor and in some cases they are justified. In a new electrification scheme, however, rotary converters are on the whole entirely satisfactory. It would seem that the greater loss in the motor generator set is an expensive way of improving the power factor.

The development of automatic or semi-automatic control of substation equipment materially affects the question of substation layout and location. It is now quite feasible to control all our substations from the power house and the equipment is such that the only attention required is that which can be given by the motor inspector employed in the particular department where the apparatus is installed. This so reduces operating expense that we can afford to have more substations and save on our distributing copper. The freedom of layout gained thereby is a decided advantage.

The only practical system to use requires a flywheel motor generator set for supplying power to a direct-current reversing motor connected to the rolls, and it is not likely that this scheme will be changed by future developments. Details of the machines vary somewhat with different manufactures and it is only necessary to point out that substantial mechanical construction is necessary on account of the shocks to which the machines are subjected. The control equipment is important and the manufacturers have used a variety of schemes. There is more than one way of solving the problem, but the final result should be that skill on the part of the operator is not necessary

Provision should be made in the layout to insure that the machines are properly ventilated at all times and a failure of the air supply should shut down the equipment before it can be injured. The electrical design is in general best left to the manufacturer. For instance, whether single or double armature motors are used is immaterial unless it involves a machine of more than usual voltage. When the power required is greater than can be supplied by a single generator flywheel set, the tendency is to run two generators in series on one motor. If this involves using a total armature voltage of 1000 to 1500, it is preferable to use two motors and connect all the machines in series which if they are arranged alternately, generator and motor will limit the voltage at any point to that of one generator only. It is preferable not to exceed 750 volts if possible. It is advisable not to exceed 750 volts if possible. It is advisable to supplement the usual ring lubrication with a gravity oiling system to all the bearings of the flywheel set and reversing motor as this in an insurance that is worth the small expenditure. Watercooling of the flywheel bearings is sometimes adopted and is desirable if they are heavily loaded.

Constant Speed Drives

For constant speed drives alternating-current motors are generally used, direct-current motors being used only in some of the older plants where only direct current is generated. These machines have reached a high state of development, and improvement during recent years has only been of a minor nature toward reduction of cost.

As any large power station involves generating alternating current, the problem of building an alternating current equipment, the speed of which could be adjusted for different mill conditions, presented a serious problem for many years. During the last 10 years it has been solved satisfactorily in two different ways. The first scheme uses an alternating-current main motor and an alternating-current auxiliary commutator machine. Such machines have involved some technical difficulties which have been overcome successfully. These equipments are arranged so that the driving motor can be run above or below its synchronous speed which reduces the size of the auxiliary apparatus required. Should the auxiliary apparatus fail, the driving motor will run at the middle speed.

The second scheme that has been adopted uses an alternating-current motor on the same shaft with which there is mounted a direct-current motor and there is an electric connection between the two through a rotary converter. This scheme uses ordinary types of machines which have been highly developed. While it is possible to run the set above the synchronous speed of the alternating-current machine, the speed cannot be regulated at points close to the sychronous speed, or say within plus or minus eight per cent, and it cannot be brought above the synchronous speed except under light load such as might be due to the friction of the mill alone. Therefore it is generally arranged, so that the motor without auxiliary equipment, runs at the maximum speed and the speed is reduced through the regulating equipment. This scheme has the natural

characteristic of developing an increasing torque as the speed is reduced, the power remaining constant throughout the speed range.

Many installations of both of the above described arrangements are giving thoroughly satisfactory results and frequently price will be the determining factor as to which one is used. Another arrangement is sometimes used and under certain circumstances provided the best means of securing an adjustable speed drive. It is to use a rotary converter to change the alternating current to direct current and to drive the mill with a normal direct-current and to drive the mill with a normal direct-current motor. This scheme is advantageous where a large speed range is required, particularly on 60 cycles. The efficiency of the first two schemes is approximately the same. The use of a rotary converter and direct current motor involves a loss of usually from 3 to 5 per cent more than that of the first two schemes.

Where a number of motors are used to drive rolls in tandem and the metal is in the different stands simultaneously, the relative speed of the motors must be maintained the same, although different conditions will require the speed of all to be raised or lowered. This problem is solved satisfactorily by the use of direct-current machines, the desired characteristics being obtained by special control equipment..

Auxiliary Drives

Experience has shown that the best practice is to drive auxiliaries that start and stop frequently with direct-current machines, and also to use direct current where it is desirable that the speed increase if the load is reduced, as for instance on cranes. It should be used in all cases where the speed has to be adjusted for different conditions, such as for instance, machines, tools, etc.

Alternating current motors are used in cases where the machines run continuously or have to start infrequently, such as for shears, saws, blowers, etc. The use of alternating current for driving motors, which start and stop frequently, has been tried but general experience is that the direct current machines handle the work better and their characteristics are better suited to the requirements. Motors for auxiliary equipment have been standardized by the principal manufacturers and designs are thoroughly reliable. Minor details are being improved upon from time to time but no radical changes are to be anticipated. Progress is still being made in the development of controlling devices.

In the past the choice of motors for auxiliaries and the gear ratios has been largely a matter of guess work. It is not necessary, that this be so, and a little preliminary study will usually enable a layout to be made that will operate satisfactorily from the start. Such a study will not only save many changes, but frequently will also indicate how the electrical equipment can be simplified so as to consist of a few simple units only.

Installs Pulverized Coal Burning Equipment

In connection with the use of blast furnace gas in a new boiler installed at Ensley, Ala., the Tennessee Coal, Iron & Railroad Co. will use pulverized coal as a fuel for steam generation. The installation of the complete coal drying pulverized and conveying system to serve this plant will be made by the Fuller Engineering Co., Allentown. Pa. It will include the burners and feeders for five 834-horsepower boilers built by the Babcock & Wilcox Co., New York, and designed to operate at 200 per cent of the rating.

The pulverized coal equipment will consist of a 5-foot 6-inch x 42-foot indirect-fired rotary coal drier using blast furnace gas as a fuel; two 46-inch gear driven, screen tight, pulverizer mills direct connected to motor; a pulverized coal transport system together with five take-off valves and six bin indicators, 25 feeders and 25 vertical burners. The boilers will be located approximately 600 feet from the pulverizing plant and the fuel will be conveyed directly from the pulverizer to the boiler bin by the transport system. Fuel will be diverted from the main line to the individual service bins through distributing valves and branch lines. Automatic bin indicators will be installed on the bins to keep the operators advised at all times as to the fuel supply.

Plant Doctors Healing Industrial Ills

(*Concluded from Page* 1549)

and then in most cases it is too late. As a result, through impaired health we have inefficiency, a liability to industry, the family and the community.

Industrial ill health and inefficiency are due to lack of proper ventilation,—gases and fumes; lack of proper lighting; necessity for change of occupation due to loss in sight, lung trouble, bodily injury or disease; improper sanitation, and occupational diseases.

The doctor should anticipate and remove the causes of ill health, either in the environment or in the human machine. Preventive medicine and the doctor's advice are surely as important and warrant as much attention as we are giving to accident prevention from the educational and mechanical standpoint; and especially so when many accidents are due to the ill health of the individual.

Good will is essential to competent medical supervision. The plant doctor finds himself many times in a position in which he can bring foreman, superintendent and the employe to a better understanding of each other. You know there are times in the lives of all men when things go wrong, times when we need a friend, when you feel that you "just must" talk things over with someone. This happens to you and it happens to the lowest man in your plant.

It has been said that corporations have no souls. If this be true of corporations which have included a physician in their organization then it is the fault of the physician for it is his duty to put a soul into a corporation. The steel family is a big one and one small doctor is not going to change time-worn ideas, but if he keeps pegging away and sticks to his purpose, and he is sincere and right, a man with ideals and courage, he is bound to make his presence felt and you are all going to help him.

The success of industry in the broadest sense can be measured by the degree of understanding and good will attained betwen management and men. The doctor is a promoter of good will. The human ills of industry are mainly due to lack of points of contact between the man and the master. The doctor is a point of contact.

The deepest and most lasting form of gratitude is given to him who relieves the sick or injured of their pain and consoles them in their hour of trouble.

The industrial doctor of the proper type is the most potent individual force in industry if empowered to care for the human machine while subject to the occupational environment of the job.

Departments of the National Tube Co., McKeesport, Pa., will compete for a safety trophy each month. The trophy is 26 inches high, mounted on a concrete pedestal 30 inches high. It will be awarded permanently to the department which has the highest safety average for two years. At the base is the following motto: "A Careful Man Is the Best Safety Device."

According to reports received by the National Federation of Iron and Steel Manufacturers from 136 companies producing iron and steel in Great Britain, which employ 95,921 men, the actual earnings per man per week in February were £2 14s 8d ($12.10) compared with £2 19s 4d ($13.05) in January and £4 13s 11d ($20.70) in February 1921.

Newcastle Steelworks of the Broken Hill Proprietary Co., Newcastle, New South Wales, Australia

Australian Steelworks Modern

Description of Broken Hill Proprietary Co.'s Plant and Others Shows How British Interests Are Building Substantially for Future of the Great Commonwealth—Large Ore and Coal Deposits Available

BY DAVID BAKER

AUSTRALIA, the farthest outpost of the British empire, occupies the unique position of a colony of a little more than 5,000,000 people holding undisputed sway over a whole continent with an area greater than that of the United States, excluding Alaska and other noncontiguous territories.

This all-British community with its undeveloped, in fact unexplored, resources is one of the most important sections of the great empire of which it forms a part, due to its location entirely in the tropical and temperate zones, its mineral wealth, pastoral resources, position in the South Pacific, and the independence, virility and loyalty of its population.

As the discovery of iron ore deposits in the commonwealth is associated with the early attempts at iron making, this latter development will be considered in connection with reference to ore deposits of each state. The most important deposits in western Australia are the deposits of Koolan and Cockatoo islands in Yampi sound. The main deposit on Koolan island is estimated by the state mining engineer to be 68,850,000 tons of iron ore averaging about 65 per cent iron, 6 per cent silica, 0.06 per cent phosphorus, and a trace of titanium oxide. On the northern end of the island there is another deposit, estimated to contain 7,800,000 tons. The engineer reports that on Cockatoo island there is a deposit of hematite available above high water level amounting to 13,850,000 tons, averaging about 68 per cent iron and 2 per cent silica. Another deposit occurs on the northern end of this island, and is estimated to contain 7,000,000 tons of iron ore.

The ironstone deposits of south Australia are very numerous, but the only ones that have been extensively worked are the Iron Knob and Iron Monarch deposits, owned by the Broken Hill Proprietary Co., Ltd. The government geologist of South Australia estimated these to contain at least 21,000,000 tons. This computation has since been shown to be a conservative one, and a later geological report puts the estimated ore reserves at 130,000,000 tons. Later exploration in this vicinity by the company has proved two further valuable deposits of iron ore, which have been named the Iron Prince and the Iron Baron.

Blast Furnace Erected in 1873

A small charcoal blast furnace was erected near Mount Jagger, about 11 miles north of Victor harbor, in 1873. Ore was obtained from an extensive deposit of magnetic iron ore which caps the summit of Mount Jagger. Owing to the workmen not being sufficiently skillful, the furnace frequently became blocked and operations were not successful.

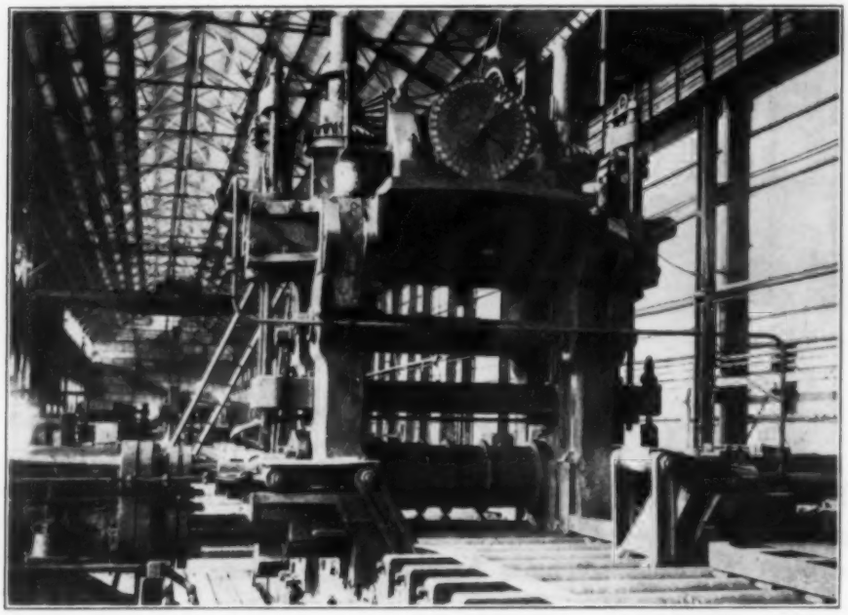
It is estimated the Lal Lal deposit in Victoria has 750,000 tons of available ore, containing 68 to 70 per cent oxide of iron, 16 per cent silica, and a trace of phosphorus. About 1875 a small experimental blast furnace was erected at Lal Lal, near Ballarat, and a small quantity of pig iron produced from ore which forms a crust upon the older rocks in this locality.

A summary of the iron ore deposits of Tasmania supplied by the geological survey in 1919 gives an estimate of 41,900,000 tons. The British & Tasmanian Charcoal Iron Co. was formed between 1872 and 1875 to exploit the deposits in the Beaconsfield district. Several hundred tons of pig iron were produced, but on account of its containing 5 per cent chromium and not being adaptable to ordinary uses, the operations were not a financial success. Tool steel was made in experimental quantities in 1872, and in 1876 a blast furnace was blown in with coke as fuel, Bulli coal being coked in a battery of 40 coke ovens on the ground. In about 10 months 2000 to 3000 tons of pig iron was produced, and in 1877 the furnace was again in commission, producing about 250 tons of pig iron per week, containing from 2 to 10 per cent chromium. There was only a limited local market for this class of iron, and operations were suspended.

The Mount Biggendon district in Queensland has high-grade iron deposits from which bar iron of good quality has been produced by the Maryborough iron founders. The estimated quantity of ore available in this district is 500,000 tons. During the war a royal commission was appointed by the Queensland government to inquire into the advisability of establishing state iron and steel works, but owing to the prevailing business depression, all work on the proposed works has been stopped.

The iron ore deposits of New South Wales are both numerous and scattered. A summary taken from a publication of the geological survey of New South Wales in 1901 gives an estimate of 53,017,000 tons. The first attempt to manufacture pig iron in New South Wales was made at the Fitzroy Iron Works, near Mittagong on the Southern railway in the 50's. Smelting operations eventually were discontinued. In 1859 the works were leased by Messrs. Latton, Enoch Hughes and William Hughes. They built the blast furnace which is now standing, and erected blowing engines. The furnace is constructed of Hawkesbury sandstone, is 49 feet high, and the interior diameter at the bosh is 14 feet. Anthracite coal, obtained from the Nattai valley, and

Abstract from a paper read before the American Iron and Steel institute in New York, May 28. The author is general manager, Broken Hill Proprietary Co., Newcastle, New South Wales, Australia.



BLOOMING MILL OF THE NEWCASTLE STEELWORKS

charcoal were used as fuel. Smelting operations did not proceed satisfactorily and little iron was produced.

During 1864, 1865 and 1866 the works were managed by a Mr. Hampshire, and under his management considerable progress was made. He introduced the hot blast and erected puddling furnaces and rolling mills. About 1875 the works were taken over by the Fitzroy Bessemer Steel and Hematite Iron & Coal Co., and from February, 1876, to March, 1877, 3242 tons of pig iron was produced.

The foundation of the blast furnace for the Lithgow (Eskbank) Iron Works was laid on New Year's day, 1874. Smelting operations commenced in October, 1875, and were carried on intermittently for several years, about 22,000 tons of pig iron being produced. As the operations were not financially successful smelting was discontinued after a few years, and the blast furnace was pulled down. After the cessation of smelting operations the Lithgow works were for a short period carried on under a co-operative system by a party of workmen, the rolling mills being chiefly employed in rerolling old iron rails.

Building Modern Plant

In 1885, the works were taken on lease by W. Sanford, and after that date considerable progress was made, and large quantities of scrap iron was worked up into bars, sheets, and the like. A sheet mill, a galvanizing plant, and machines for the manufacture of railway spikes were erected; also a Siemen's steel furnace was added to the works, and in this furnace steel was manufactured for the first time in the colony.

The Hoskins Iron & Steel Co., Ltd., is owned and operated by C. H. Hoskins and members of his family. He purchased the Lithgow Iron Works from W. Sanford and took possession on Jan. 1, 1908. The plant at Lithgow at that time was extremely antiquated and inefficient, with the exception of a new blast furnace which had recently been installed. With the exception of the blast furnace and the 18-inch mill, both of which have been considerably altered, the plant has been torn down and removed, and is being replaced with a thoroughly modern plant. The company has decided to abandon the making and rolling of wrought iron and to concentrate on the production of steel.

The various plants operated by the company are as follows: The main iron and steel works are situated at Lithgow on the Blue Mountains at an elevation of 3000 feet above sea level, and 96 miles west of Sydney. Engineering and cast iron pipe works are situated at Sydney and at Rhodes, a suburb of Sydney. A colliery comprising 5000 acres of coal land, together with a coking plant, is situated at Dapto, on the coast, 56 miles south of Sydney in the southern coal field. The company recently purchased 400 acres of land on the coast at Port Kembla, eight miles distant from the colliery and coking plant, with a view to establishing a modern steelworks to allow for future extensions whenever required. One of the directors has just returned from an extensive tour of England, United States and Canada, where he gathered information regarding modern iron and steel plants.

The Lithgow company is practically self-supporting for all its raw materials, as it owns numerous iron ore properties in New South Wales and Tasmania, together with extensive coal properties and limestone deposits. Its ore properties are estimated to contain 80,000,000 to 100,000,000 tons of good ore.

The Lithgow Steel Works has a coke oven plant of 95 Belgian-type, nonrecovery ovens with a capacity of 1500 tons of coke per week. There are two blast furnaces which have a combined capacity of 150,000 tons per annum. These are at present handfilled, but it is expected they will be enlarged and mechanically charged in the near future.

The open-hearth plant consists of three modern furnaces of 50 tons, 70 tons and 80 tons capacity, respectively. A fourth furnace is now being added, which will have a capacity of 80 tons. The bar mills consist of one 18-inch two-high pull-over mill, one modern 10-inch guide mill and one 9-inch guide mill. The 10-inch mill has just been installed in a fine building 70 feet wide by 400 feet long. The 9-inch mill is situated in in a similar building alongside the 10-inch mill and is at present under construction. The works have their own engineering shops and foundries and alterations and extensions to the plant are carried out in these departments. All classes of carbon steel are manufactured, including a large variety of spring steel, together with numerous special qualities for the manufacture of small arms as well as other specifications.

The company's cast iron pipe works are the largest in Australia. The capacity of the pipe works is 1500 tons per week, working one shift of 8½ hours.

From Silver to Steel

According to an authority the Broken Hill Proprietary Co., Ltd., sprang from the first "syndicate of seven" on Mt. Gipps Station, Western New South Wales, and the succeeding Broken Hill Co. of fourteen, which in 1885 controlled the greater part of that famous lode of the "Great Barrier Reef" called "Broken Hill." Within 34 years the Proprietary mine in Broken Hill yielded 173,451,037 ounces of silver, 1,279,334 tons of lead, and 102,857 ounces of gold. It paid to its shareholders $50,708,822 in cash dividends, $2,726,400 in cash bonuses, $2,764,800 in cash from the flotation of the British Broken Hill Proprietary Co., Ltd., $8,371,200 in shares in the companies floated from the parent company, a total of $64,571,222. In that period it distributed $64,073,088 in wages.

It developed wide markets in Europe for its silver and lead, and by the discovery of the "flotation process," converted a bank of 5,500,000 tons of unworkable sulphide tailings into an asset of the vale of $150,000,000, based on the metal contents. It established its famous lead smelters and refinery in South Australia, the Port Pirie Works, and for flux obtained possession of

the Iron Monarch and Iron Knob on the western shore of Spencer's gulf in the same state.

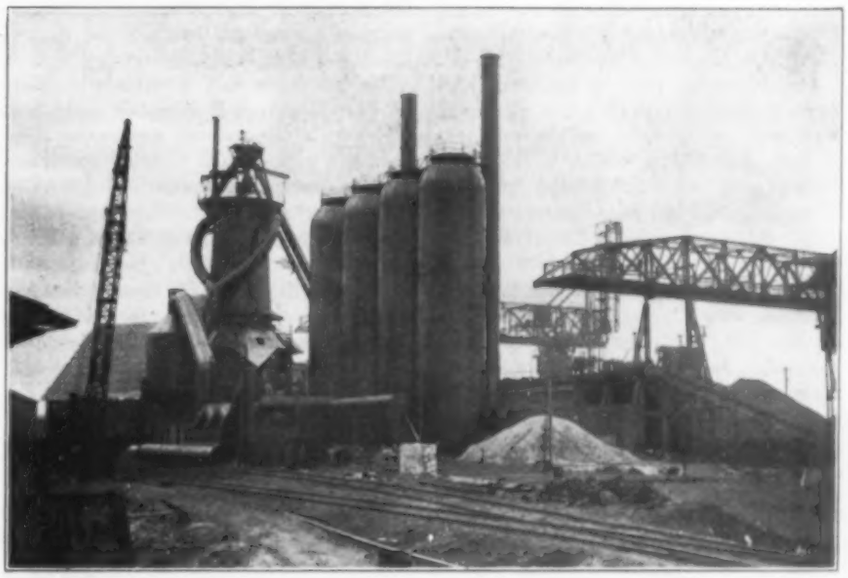
The company at that time was producing from its lead furnaces about 400 tons per day of lead-silver bullion, carrying a certain quantity of gold, and had therefore built up an important export trade of these metals, but no attempt was being made to utilize its large deposits of iron ore, other than as flux for the lead smelters. The imports of pig, rails, billets, bars, shapes, wire products and sheets during 1909 were valued at over $20,000,000

About this time the board of directors began to consider the advisability of utilizing its large assets of iron ore for supplying the demand in the country for iron and steel products, and in 1911 it sent the general manager, G. D. Delprat, to Europe and the United States to visit iron and steel works and obtain information to assist it in making a decision. As a result, the writer was engaged to come to Australia and investigate the subject, and report to the board on the advisability of undertaking the project. At that time some 400,000 tons of ore of the following average analysis had been mined from the Iron Knob deposit for flux.

The original deposit called Iron Knob and Iron Monarch consists of two separate mountain masses of solid, almost pure hematite, with varying percentages of manganese. Certain parts contain as high as 10 per cent manganese with 55 per cent iron, while the bulk of the ore contains about 0.6 per cent manganese, and there are certain parts of the deposit almost entirely free from this metal. The ore is quarried from the side of the mountain, loaded with steam shovels on to skips which traverse an incline to loading bins, from whence a haul of 35 miles by rail over the company's tracks delivers the ore to the crushing plant adjacent to large loading bins. The crushed ore is loaded into the ships on a belt at the rate of 1000 tons per hour. From the point of shipment to the port of Newcastle the distance is 1200 miles, passing the cities of Adelaide and Melbourne. Returning, the ships deliver steel or coal to the cities named.

The most important coal deposits of the country so far developed are located about the mouth of the Hunter river, Newcastle, New South Wales, and the upper seams of this deposit extend southward 60 miles under the city of Sydney, at a depth of 2000 feet, and re-appear again at the surface about 45 miles south of Sydney, close to the Bulli and Bellami. These two fields are estimated to contain 115,000,000,000 tons of available coal, all of coking quality, rather high in phosphorus.

As the coke from the northern field of New South Wales was considered by the writer more suitable for use in blast furnaces, a site for the Newcastle works of the Broken Hill company was chosen at the port of Newcastle where a channel from the works to deep water could be secured to a depth of 25 feet at low tide. While the coal underlies the city and harbor of Newcastle, the average haul to all mines of the field is 15 miles. The limestone for fluxing purposes is obtained from a large deposit in Tasmania close to deep water, and an ore boat is dispatched occasionally to this quarry to keep up the supply to the blast furnaces. This stone is a calcite, averaging about 6 per cent in insoluble matter.



ONE OF THE THREE BLAST FURNACES OF THE NEWCASTLE STEELWORKS. A REGULAR OUTPUT OF 3000 TONS OF BASIC PIG IRON PER WEEK HAS BEEN OBTAINED FROM EACH OF THE THREE STACKS

Description of Works

The works as originally planned were to consist of one 350-ton blast furnace, three 65-ton basic open-hearth furnaces, one 35-inch blooming mill, and one 28-inch rail and structural mill, with the necessary by-product ovens to supply coke for the blast furnace. The plans of the works were completed early in 1913, and the material ordered that year. Meanwhile, the government of the state undertook to dredge the channel to the works, pumping the sand and silt onto the low-lying property forming the site chosen for the plant.

The first cargo of material for construction arrived Jan. 1, 1914. Meanwhile, pile-driving and laying of the foundations had been vigorously pushed, until the declaration of war stopped all construction work. This stoppage lasted only a few days, the board of directors deciding that the completion of the works would make Australia independent of outside sources of supply for the principal part of its steel requirements, and might thus render material assistance to the allies in winning the war. Accordingly an organization was brought together as soon as possible, and construction work pushed so that the blast furnace was lighted March 9, 1915, and the first steel was made April 9, the first ingot bloomed the same day, while rail rolling started April 24.

The starting of the works early in the war enabled the country to push on and complete the strategic line from Kalgoorlie, in western Australia, to Port Augusta at the head of Spencer's gulf, thus connecting by rail Perth, the capital, and Fremantle, the port of shipment in western Australia, with all the large cities of South Australia, Victoria, and New South Wales. In addition, the Broken Hill Proprietary Co. furnished rails for South Africa, to replace lines torn up to supply equipment for France, also rails and munition bars to the British war department, and rolled on its 35-inch blooming mill 10,000 tons of ¼ to 1-inch plates for ship construction, as well as the joists and bulb angles for the frames of all the ships built under the direction of the commonwealth government.

Since the original installation was laid down at Newcastle, the works have been increased and now consist of the following:

Coke oven department, with 224 Semet-Solvay by-product ovens of the recuperative type, arranged for recovery of tar, sulphate and benzol.

A blast furnace department, with two furnaces, 85 x 20 feet, one furnace 20 x 90 feet, and one furnace 12 x 68 feet, the latter being used for the manufacture of ferromanganese.

The open-hearth department consists of seven basic furnaces of 65 tons rated capacity, but with hearths 33 feet 6 inches

x 15 feet, and two 100-ton pit cranes, one 75 and one 60-ton hot metal cranes, and a 1000-ton mixer.

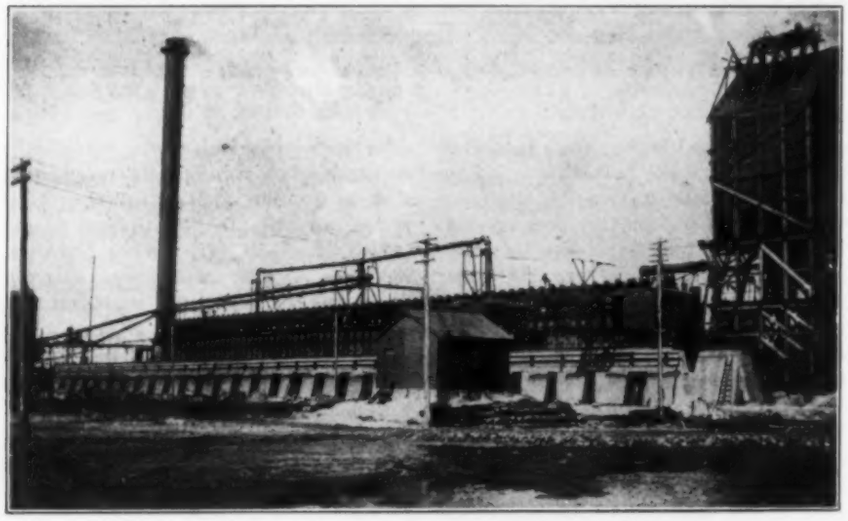
The blooming mill is provided with three 4-hole pit furnaces, a stripping crane and two pit cranes. The mill is a 35-inch geared Mackintosh & Hemphill design, with two high-pressure cylinders 42 x 66 inches, the steam pressure being 150 pounds at the engine. There are also two mechanical shears, one for cutting blooms and blanks going to the rail mill, the other for taking the billets from transfer beds and cutting this product for the market or for rerolling in the 18-inch merchant mill.

The rail mill consists of three strands of rolls in line, of 28-inch pitch diameter, and equipped with two traveling tables and a stationary saw run. The rolls are driven by a double high-pressure reversing engine with cylinder 42 x 66 inches, the steam pressure at the engine being 150 pounds. The engine is controlled from a pulpit in plain sight of the rolling operation, and while the engine is slowed down when the piece is introduced into the rolls, it is speeded up to 150 revolutions when the piece is in the finishing pass. The mill is equipped with two 60-ton traveling cranes, and a double set of housings, so that each strand of housings and rolls is lifted at one time and replaced with the other set with rolls and guides set. All blooms and blanks when received from the blooming mill are reheated in two regenerative heating furnaces fired with coke oven gas. The product of the mill consists of tee rails from 45 pounds to 100 pounds, girder rails, angles, heavy rounds, channels and joists up to 15 inches, the largest size required to date.

The finishing department of the mill is provided with three hot beds, four rail presses, and ending machines, and each rail is ended to exact length after straightening, the standard length of 80, 90 and 100-pound rails being 40 feet.

The merchant mill department consists of one 18-inch mill equipped with four traveling tables and two continuous billet heating furnaces, also finishing equipment and hot beds to take care of light rails, heavy merchant bar, fishplates and billets. One 12-inch mill and one 8-inch mill are installed in a separate building, each equipped with continuous heating furnaces and hand hotbeds. There is also adjoining the merchant mills a double-strand Morgan continuous rod mill, arranged to be fed from the billet yard receiving the product from the 18-inch mill.

Mechanical repairs and considerable construction work are economically handled by a large and well-equipped machine shop and a steel foundry equipped with a 20-ton acid open-hearth furnace; a direct metal foundry for the manufacture of ingot molds and heavy castings with hot metal from the blast furnaces; and suitable shops for the other mechanical trades.



THE NEWCASTLE STEELWORKS' COKE OVEN DEPARTMENT CONSISTS OF 224 BY-PRODUCT OVENS OF THE RECUPERATIVE TYPE, ARRANGED FOR THE RECOVERY OF TAR, SULPHATE AND BENZOL

Production at Newcastle

The production of the furnaces has exceeded the original estimates, so that there has been no difficulty in obtaining from the three larger furnaces a regular output of 3000 tons of basic pig iron per week from each stack, without forcing. This has been accomplished with a 13-foot hearth, and gives prospect that with the adoption of larger dimensions a much larger production per furnace will result.

In the production of steel in the basic furnaces, the scrap supply in Australia being a negligible quantity, the problem encountered was that of operating the furnaces on a mixture of 80 per cent pig iron and only the scrap made in the works. This situation has been satisfactorily met by a modification of design of the open-hearth furnaces, so that whereas at the start the average time for producing a heat of steel was approximately 12 hours, it has been reduced to less than 7½ hours, half-yearly average, with an occasional heat produced in 3 hours 50 minutes. It has therefore been possible to produce steel at the rate of 36,000 tons per month, with an occasional week of 11,000 tons.

The rail mill as now equipped, has a capacity of 1000 tons per day, of 80-pound rails, but by driving the intermediate and finishing strands by a separate engine or motor, and adding additional tables, the capacity of the mill may be doubled.

To provide the works against possible stoppages due to holidays at the mines, a coal storage equipment has been installed, consisting of a traveling bridge of 200-foot span, equipped with a combination trolley, one end provided with a Hoover & Mason grab, capable of lifting 5 tons of coal; the other end equipped with hoisting drums so that the 4-wheeled coal trucks from the mines containing 10 tons of coal are lifted bodily and discharge their contents on the stockpile. The reclaiming of the coal and its delivery into 50-ton steel cars of American type is done with the grab bucket.

Plans have been prepared and a large part of the equipment purchased for the following extensions to the works: Additional open-hearth furnaces to permit the conversion of 550,000 tons of basic pig iron into steel; a 40-inch electrically driven blooming mill supplying a 24-inch and 18-inch Morgan continuous billet and sheet bar mill, and a Morgan 10-inch continuous merchant mill. To supply electric power for these extensions of the plant, a power house is to be built where the surplus gas from the blast furnaces can be utilized.

Subsidiary industries: The Austral Nail Co., Pty., Ltd., of Melbourne, had been manufacturing nails and barbed wire in Melbourne for 30 years and had been manufacturing wire from American and continental rods from 1911 until 1918, at which latter date it commenced to draw raw material supplies from the Broken Hill Proprietary Co.'s steelworks in Newcastle. It was decided early in 1918 to erect a large modern wire mill in Newcastle adjacent to the steelworks and to close down the Melbourne mill. The erection of the plant commenced during April, 1918, and operations started on Sept. 26 of that year on a limited output. In January, 1920, regular production was commenced and during the first 12 months' operations 45,000 tons of wire was drawn.

Early in 1921, Rylands Brothers, Ltd., of Warrington, Eng., decided to establish Australian works, primarily for the manu-

(*Concluded on Page* 1566)

Standardizing Company Houses

Maximum of Convenience and Utility with Minimum of Expense Aim of United States Steel Corp. in Constant Study of Housing Problem—Fixed Rules Established Through Many Years of Experience—Rentals Generally Too Low

BY C. S. WOOLDRIDGE

IN THE beginning most manufacturers who built houses for their workmen did so not because they felt that this would increase their earnings or the employes' efficiency, but solely because there existed a housing shortage and they could not get men to operate their plants unless they provided places for the men to live. For the same reason many companies in isolated districts were compelled to operate stores.

At about this same period some employers began to improve working conditions in their plants. They found it was easier to get men and hold them if their plants were clean and light, had toilet facilities and were made as safe as possible. It was found that not only the turnover was less expensive, but the employes' efficiency was increased, so that today every modern plant has its department of safety, sanitation and welfare. This probably has found its most advanced expression in the steel industry.

Unconsciously perhaps, but certainly very effectively, the iron and steel industry for many years has been dealing with the family unit. Our playgrounds, club houses, community houses, athletic fields, visiting nurses, picnics, baseball games and band concerts are all matters concerning the family rather than the individual.

We have gradually come to consider that the term "industrial housing" means not merely the providing of shelter for the family, but it includes stores, schools, churches, parks, recreation fields, playgrounds and other places of amusement. In addition to these there must be provided complete utilities so that the family is not only sheltered in comfort and decency but has the means of communicating socially with other families, and the men may pass easily and quickly to and from work.

I would not advocate that the employer provide all of those things for that would be paternalism in its worst form, but it is clearly to the employer's advantage to provide some of them, leaving the balance as a problem for the community. Furthermore, those things provided by the employer should be of such a character as to insure that the standard of living is not lowered by the example.

During the war, the frantic effort to hold down the cost of houses resulted in some very bad industrial housing. Thousands of houses were built which presented pleasing exteriors but were utterly impractical from a utilitarian viewpoint. I have seen houses where it was only possible to get furniture to the second floor by taking it through the second-story windows. I have seen many bedrooms where it was impossible to close the door to the hall, or open the door to the cupboard after the furniture was placed. I know of one development where in a majority of houses there was no place for the piano except over the hot-air register. The piano usually is one of the workman's standard pieces of furniture and must be considered.

Standard Tests Devised

Three years ago the United States Steel Corp. companies began to devise a set of standard tests which are now applied to all house designs to insure against such results. These tests are the result of experience in designing and building thousands of industrial houses and are being developed gradually as we encounter weaknesses and objectionable features.

The industrial house must meet three fundamental conditions: It must fit the average workman's furniture; it must be reasonably conveneint and easy to care for, and for economical reasons it must be as small and compact as possible without interfering with the first two conditions.

A careful survey of all our existing houses enabled us to make up what we call a minimum furniture list, in which we have enumerated by size every item of furniture which the average workman owns. For instance, every bedroom in a class 2 house must contain, in addition to a clothespress, room for one double bed, one dresser, one chest of drawers, and two chairs, and we have a similar list for every room in the house. The first step in checking a plan is to draw in place all of the furniture to scale. The wall space must be such that this furniture can be placed without interference with doors, windows, hot-air registers, and electric light switches. The convenience of the house is checked entirely by observation. It must be possible to place all beds so that the housewife may dress them without pulling them away from the wall, and she must be able to get food from the ice box without going to the cellar.

The efficiency test for a two-story, class 2 house is as follows: On the second flood only we compute the floor area of all bedrooms to which we add 42 square feet for each bedroom clothespress. This total area must be at least 74 per cent of the total area of the entire second floor; or in other words not more than 26 per cent shall be devoted to stairs, hallways, partitions, etc.

We found that it was possible to meet the conditions we laid down and still not have an economically designed house, because it is possible under these rules to have the bedroom larger than is necessary and thus raise the percentage of efficiency and the cost of the house. So at this point we now bring in what we call a cubage test. The cubage of a house is the total number of cubic feet contained by the outside walls, the cellar floor, and the roof. It is obvious that in houses of identical materials and similar type of construction, the one satisfying the furniture requirements within the smallest cubage and yet having the highest efficiency percentage combines best the desirable elements of utility, compactness, and low construction cost.

After applying these tests to many hundreds of plans the Carnegie Land Co. has finally selected seven model floor plans which enable it to build anything from four to seven rooms, either in the two-story or three-story house. Our cheapest house is built over a half cellar, contains no bathroom and the diningroom and kitchen or the dining room and living room, are combined as one room. The better class of house contains separate rooms for these purposes, includes a bathroom, and is built over a full cellar. Each one of the seven plans can be

(*Concluded on Page* 1566)

From a paper presented at the meeting of American Iron and Steel institute, New York, May 20. The author is general superintendent, Carnegie Land Co.

Improving Reversing Valve Design

Type of Air or Gas Valve Providing Most Effective Seal and Affording Unrestricted Passage Is Considered Best for Open Hearths—Water-Cooled Slide with Inclined Seat Is Favored

BY WILLIAM C. BULMER

AS ALL regenerative types of furnaces require a periodic reversal of the flow of the gases through them, some mechanical agency must be employed to cause the change of direction. The chief requisites of a proper valve are an effective seal and an unrestricted passage. The choice of a valve requires most careful consideration, as upon the fulfillment of certain requirements depends the successful operation of the furnace. In order of importance we should consider, first, the valve having the minimum resistance to the flow of gases, combined with the least amount of leakage past the valve.

From investigation of installations now in use, it can be safely stated that the effective draft in the flue leading from the checkers will seldom be over 50 per cent of that found at the base of the stack. To determine the cause of draft failure, in the early stages of the campaign on furnaces at South Chicago, measurements were taken throughout the entire system of flues between the regenerative chambers and the stack. The gas valve was of a well-known type used in conjunction with a butterfly air valve, and when measurements were taken in the flue on each side of these valves there was found to be a frictional loss amounting to 52 per cent of the stack draft. This is not at all an unusual condition, as installations have been found where the effective draft in the checker flues was only 30 per cent of that of the stack. In a heating furnace at South Chicago, on account of a difficulty existing in the draft, a considerably higher stack was built before an investigation of the conditions was made. As little improvement was found in the working of the furnace, a search was then made to determine the cause of the trouble and it was found that the loss of draft, due to the valve and turns leading to and from it, amounted to 72 per cent of the stack draft. Obviously, in this case, the valves were altogether too small for the furnace. The writer has known of measurements being made at various plants on the draft loss due to the valves, and in no case has he found it to be less than 27 per cent and this on a furnace where the valves were of rather ample size.

Resistance to flow through the valves has a bad effect on the operation of any furnace, as the slowing up in the time of heats and the final shutting down of the furnace on account of the clogging of the air checkers is largely due to the lack of sufficient draft to pull the waste gases through the restricted opening. The dirt will accumulate in inverse proportion to the draft at the checkers, and only a sufficient pull at all times will insure a sharp working furnace. It is not difficult to decide, therefore, that the type of valve to choose is one that will permit of the draft at the checkers being as near to that of the stack as possible.

In addition to the valves, another factor which should be considered with reference to a free flow of the gases is the directness of flue passage with the shortest possible length, not only between the furnace and the stack but also between the gas producers and the valves. Sharp turns in the flues, poorly designed valves, or a combination of both, will have a very detrimental effect upon the working of the gas producers, as it requires excessive pressure to drive the gas to the furnace, resulting in poor gas and improper producer operation.

Advantages of the One-Way Valve

Valves may be divided into three groups, namely: one-way, two-way and four-way, depending upon the number of directions of gas or air passage through them. Those of the one-way group are the only ones which offer means of regulating the flow of gases to and from each checker chamber separately without additional equipment in the form of extra dampers or valves.

If a furnace is designed for proper distribution of the waste gases between the air and gas checkers, this distribution will not be maintained for long without proper valve regulation. The accumulation of dirt in the air checkers will add frictional resistance, which will decrease the proportionate amount of waste gases going through these checkers and the furnace will soon be thrown out of balance. By the use of a one-way valve, manipulation of the floor stands can be made to open the valve to any required degree, and at all times in the furnace campaign any desired proportion of the waste gases can be put through either of the chambers. The same regulation of the incoming gas can be made to offset the disadvantage of unequal port areas on either end of the furnace. This regulation should be particularly useful in a plant which does not run through Sundays. With only sufficient gas kept on the furnace during the Sunday shutdown to keep the furnace hot, the air chambers usually become much colder than the gas chambers and it is not until two or three days later that the temperature of the chambers is properly balanced. With a single-way valve installation, the regulation can be made such that practically all the waste gases, during the period in which the furnace is simply being kept warm, can be caused to go to the air chambers thus keeping them up to a much better temperature than would otherwise be the case.

Another advantage of a single-way valve is that it can be adopted to any desired flue layout and could often be readily installed to correct present difficulties, due to poor flue arrangement, with a poorly constructed valve that might be in use. For waste heat boiler work a valve giving straight line flow with a minimum of exposed water-cooling will give the best results. Not only does this type of valve insure higher waste gas temperature to the boilers, but because of their offering practically no resistance to the passage of the gases, they require less power for operating the boiler fan. The argument might be offered that where waste heat boilers are used, sufficient draft can always be obtained by the use of a sufficiently large fan, but this would be poor reasoning, for if betwen the stack and furnace ports certain frictional resistance can be tolerated, it is much better to have this resistance offered by a closer laying of checkers than by unnecessary resistance through the valves or with normal areas through the checker chamber. The less the resistance offered by the valves, the smaller the incoming and outgoing ports can be made, which will result in better combustion conditions.

Valves may be of the following types: slide or damper, butterfly, mushroom and movable hood. They may be

From a paper presented at the New York meeting of the American Iron and Steel institute, May 26, 1922. The author is superintendent of open-hearth and bessemer departments, Ohio works, Carnegie Steel Co., Youngstown, O.

as dry, refractory-lined, water-cooled and water-sealed.

The slide and butterfly types may be of any of the classes or combination of classes, but the water seal is rarely applied to them. The mushroom type may be of any of the classes. The movable hood type is usually refractory-lined and water-sealed, although the refractory lining is sometimes omitted. In a general way the butterfly valve may be considered as a modified slide or damper, and we can state that the slide valve of all those devised, offers the least obstruction to the passage of the gas through it.

In the dry class no attempt is made to cool the casting or plates of which the valve or its seat is made. The slide and butterfly are frequently of this character.

The refractory-lined valves are confined mostly to the slide, mushroom and movable hood types, although nearly all have the surrounding hood, where such is employed, lined with brick. Refractory linings are hard to hold in place because of the jar that accompanies the reversal, and no matter how tightly wedged when put in service the lining will eventually loosen and fall out.

The water-cooled valves embrace the slide, butterfly and mushroom types. They have the principal parts, including the seat, filled with moving water, whereby an even temperature within the member is maintained and distortion from expansion and contraction prevented. However, they are not always reliable in this respect.

About the year 1914, experiments were begun with a water-cooled damper valve made of rolled steel plate and at the present time it is possible to procure a welded steel plate valve working on an inclined water-cooled seat, each having machined surfaces where contact is made, that will give a minimum amount of leakage and is so constructed that any expansion or contraction that might take place does not tend to distort the valve and destroy the seal. Some trouble was experienced with the accumulation of a carbonaceous material on the face of the valve which might tend to cause leakage, but with the present valve the trouble has been so slight that it is being given very little consideration. The adoption of a refractory surface, where the valve is exposed to the producer gas, will materially aid in eliminating any slight trouble that might be caused from this source.

Seal Is Satisfactory

Water-sealed valves provide the most perfect seal that has as yet been devised and can be used effectively with the mushroom or the movable hood. In each case a projection of the valve is plunged into a basin of water of sufficient depth so that the liquid column will more than balance the difference of pressure within the conduit and the atmosphere or adjacent passageway. The glaring fault of this class of valve lies in the water evaporation that takes place from the basin; the passing hot gas picks up the vapor and is cooled to an appreciable extent. There is also more or less water splashed into the gas flues at each reversal. This not only must be evaporated, but coming in contact with the brickwork of the flue causes deterioration. At the Gary works of the Illinois Steel Co. on some of the stationary producer gas furnaces, the change from a valve having exposed water and exposed water-cooled parts to one having a minimum amount of exposed cooling surface, resulted in an increase of temperature in the waste gases going to the boilers of approximately 180 degrees. This temperature difference checks up very well with the usual temperature drop found through the ordinary types of valves which offer a large amount of exposed cooling surface, and in one investigation the writer found the temperature to show a difference of 240 degrees. A similar change of valves at Weirton has resulted in their increasing the waste heat boiler output from 58 per cent to 78 per cent of rating. Weirton operators are getting this rating from their boilers on a low coal consumption, which, when their furnaces are working properly, is in the neighborhood of 450 pounds per ton of ingots.

Leakage Occurs Occasionally

Another objection to the use of a valve having a water-sealed seat has been that it is always liable to leakage in portions that are hidden from view of the furnacemen, and it is only when the effect upon the working of the furnace is noted that inspection, which in most cases is difficult, proves that the trouble is due to a crack in the casting, and it not infrequently happens that a negative pressure will cause a portion of the water to syphon from the basin into the flue. The substitution of welded steel plate seats for cast iron seats has to a great extent eliminated the trouble due to leakage, but the immersion of the valve into the water when the seal is made will remain a constant factor in the splashing of water over the edge of the seat and into the flues. The brick walls that form the flues and support the valve suffer from the effect of this moisture and the resultant weakening of the joints often causes leakage of gas from the gas passage into the waste gas flue, which often continues for a considerable length of time before becoming sufficiently bad to cause detection. The impact upon the seating of certain types of water-sealed valves is an added source of destruction to the seat, and not only do you have a serious loss, due to leakage of water into the flues, but in most cases it is necessary to stop the operation of the furnace until the seat can be replaced.

An added security is provided against gas leakage past the valve in one make in which the flues are completely separated by means of a brick-lined tube, acting on the same principle as a switch in a railroad track, whereby the flues are connected as desired and the change in the flow of gas controlled. The water in connection with this valve is of comparatively small area, open to inspection at all times.

For moving valves every known method has been applied, including hand power, hydraulic, pneumatic and steam cylinders, and electric motor. The latter method is no doubt the most satisfactory, and its popularity will increase in the future. Whatever the mechanism employed, it should be of a sturdy character and able to withstand the strains that are put upon it.

Much thought has been given to the development of a satisfactory water-cooled valve and seat, and to one having a perfect seal, but it would appear that with the exception of two of recent invention, i. e., one in which one end of a section of flue swings through an arc of a circle connecting adjacent flues, and the welded steel damper type having an inclined water-cooled seat with machined working surfaces, few measure up to the requirements we have stated for an ideal valve. Too much weight should not be given in the choice of a valve to the first cost, providing satisfactory operating conditions in all respects can be attained.

The author believes the water-cooled slide with inclined seat comes nearest to the perfection we are seeking. Its durable mechanical construction, including sturdy manipulating devices, all of which is easily accessible for repairs, combined with straight line flue passages, least heat losses, independent control of flow for each chamber, minimum leakage, adaptability to local conditions, small space required, minimum loss of fuel at time of reversal and low maintenance cost, recommends it to our serious consideration.

Studies Sulphur in Coke

In a physico-chemical study of sulphur in coke, A. R. Powell, physical organic chemist of the United States bureau of mines, has found that ferrous sulphide decomposes in coke when cooled. An isotherm indicated that sulphur remained in the coke in the absorbed form, the bureau announces. After acid extraction and heating in a tube some sulphur was distilled and collected on the cold ends.

Co-ordinating Foundry Control

How Five Large Castings Manufacturing Plants Solved the Problem of Executive Control Involved Through Combining the Direction of General Shop Practice and Research Under One Directing Head

BY D. M. AVEY

ENOUGH has been said in a previous article regarding the details of some investigations of the Electric Steel Founders' Research Group to show the thoroughness and extreme importance of these in the operating plan. An explanation of the general inspections by the research director may serve to suggest to other steel casting plants a method of systematic scrutiny which has proved of value. The director's duties fulfill the best conception of what is asked of the modern company doctor. He is expected to search out sources of probable future troubles, to prevent them as well as to aid in curing ills which exist. Major Bull makes periodic visits to each plant, preparing reports on them in turn, copies of each of which are sent to all members. He comments upon such items as shop appearance; safety precautions; economy in equipment operation; waste prevention; sand mixing and condition of facing; condition of molds and cores; furnace operation; condition and handling of metal while pouring; effectiveness of annealing and welding; condition of castings when shaken out and when ready to ship; and efficiency and morale of the shop organization. No point which has to do with the welfare of the plant or the quality of its product is omitted intentionally. A typical report which is abstracted on another page serves to give an idea of the painstaking care and diligence shown in these inspections; likewise the frankness with which comments are offered in the knowledge that they will be received in the proper spirit. The names of the plants have been disguised in the abstract appended, which is one chosen at random.

These reports of general inspections have instilled into each organization a spirit of healthy rivalry. They are passed along to metallurgists, melters, foremen, and others in charge of the different lines of work under consideration. Like the frequent but irregular visits of bank examiners, these inspections by Major Bull furnish an incentive and keep the working forces of each shop on its individual and collective toes. The director's recommendations are backed by the full authority of the executive staff in each plant. For example, if he suggests a change in the sand mixture the matter is given immediate attention and the results are checked. The standard of every shop under this system of inspection and report constantly is being brought into line with the best practice that prevails in each other plant of the group.

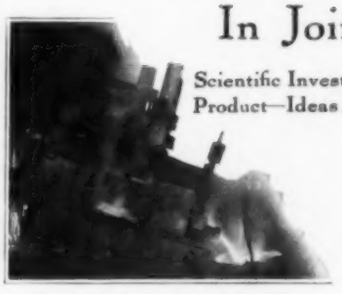
Critical Observation

The director's inspection of the finished product frequently is more critical than that given by the customer because he has the collective welfare of the entire group to guard. Commercial specifications for steel castings are supplemented by a complete set of inspection standards developed by the group and governing its entire production. These standards in every case are paramount, and selling prices, difficulties in manufacture and other considerations are subordinated in the sincere effort to produce the best steel castings for the purposes required.

The results of the strict application of this practice are evident in many small details as well as in the main phases of foundry practice. For example, except where the customer stipulates a different procedure, all castings are carefully annealed; surface imperfections, even of slight extent caused by dirt or slag, must be chipped out thoroughly before being welded; all cored holes for the application of other parts are carefully cleaned of adhering sand, regardless of whether such surfaces will be machined later; the use of any form of filler for defective cavities or crevices is strictly prohibited; the closest scrutiny is required prior to welding; and except where because of frail design distortion might result, all castings are put through a tumbling barrel to give them a superior finish. The standards further require the manufacture of production jobs to be accompanied by systematic cutting and machining of typical castings to ascertain interior soundness. In effect, the research director acts as a chief inspector, checking up the performance of the inspectors at each plant in their adherence to the rigid standards established by the association. The director is particularly watchful over such matters as the quality and appearance of castings as delivered to the consumer. Realizing that an inferior product shipped by any one plant will detract from the good reputation sought by the collective membership each plant expects the director to point out in a positive manner all details wherein any laxness is shown. A further check on the inspectors is obtained by a report transmitted monthly to the director from each plant showing the castings returned by customers as unsatisfactory.

Steel Foundries Co-operate In Joint Research

Scientific Investigations Lead to Better Product—Ideas Are Freely Interchanged



UNDER the preceding title, THE IRON TRADE REVIEW, *in the issue of May 25, presented a synopsis of the history, organization and purposes of the Electric Steel Founders' Research Group. The operation of this group presents such a novel illustration of technical co-operation that the accompanying discussion of the detailed plan, the mechanics of its operation was solicited and prepared with the full assistance of the associated companies. The facts given present an object lesson in industrial management and typify modern reciprocity in technical ideas. The same cordial spirit, based on a willingness to assist others in the foundry business is shown in the offer of the group to make available the results of its research studies. This information will be presented from time to time through articles in* THE IRON TRADE REVIEW.

the nature of the defects, and the extent to which the inspectors were apparently responsible because of careless examination. The director's criticisms concerning the inspection as conducted at any plant are disseminated to all the other group plants.

It was stated in the forepart of this article that regular reports transmitted to and from the office of the research director constitute an important feature of the group's activities. At the close of each month, the members transmit to the director, among other reports, one showing the tons produced; the tons shipped; the average weight of castings shipped; and the percentages of the following items; good castings to charge; heads and gates to charge; shop defectives to charge; spills and skulls to charge; charge unaccounted for; shop defectives to total castings and return castings to total sales. An interesting feature of this report analyzes the shop defectives as made at each plant monthly, indicated by the six principal causes for bad castings. The percentage for each of these six causes is calculated, illustrating clearly the relative importance of every such cause for

Inspections Cover Infinite Detail

General Inspection of Plant X

General Features

THE shop was in a less cleanly condition than any other shop of the group that I have seen lately. Plant *Y* recently conducted a vigorous clean-up campaign with excellent results which they now feel to be reflected in low operating costs. Many parts of your shop were untidy, detracting from the good effect which the condition of your castings alone would produce upon an outsider.

Among the departments open to criticism from this standpoint, your laboratory takes a prominent place, both because of its present condition and because of its location. The accumulation of many old trade journals and of old records and the indifferent care given some of the laboratory equipment indicates an inadequate appreciation of the value of such equipment. The moral effect of this condition is probably felt not alone by visitors but by foremen.

On bright days many electric lights were observed burning to no purpose. This matter can wisely be supervised by a designated person.

Many sections of air hose were leaking, and air hose connections were in bad order. Under present operating conditions the justification that exists when operations are heavy is not present.

Safety precautions were not being carefully observed. Some of those pouring steel were not equipped with leggings and only one workman was wearing goggles. The advisability of ample precautions in these respects has been noted previously. In the passageway near the cleaning room and leading to the stairs to the production office, a hole is noted in the floor which might cause serious accident.

Sand Mixing

Your facing mills are in poor condition as regards the plows, mullers and plates. The condition of some of the plates and mullers is not one that can be remedied frequently like the plows. The latter should have systematic and careful attention by persons specially delegated. The expense of so doing is compensated by the results obtained in the mixtures.

The operator at one mill has been furnished with a bulletin board on which the proportions are indicated for his guidance. The operator of the other mill had no such visible instructions. While the instructions were specific, the mixture specified is *not* the one as recently modified and now intended to be used. Written instructions should be up-to-date.

One core mixture now in use to a considerable extent is stronger than is desirable for some of the work on which this mixture is used. This consists of: Thirty-five shovels of silica sand; 3 quarts of wheat flour; 12 ounces of resin; 2 pints of boiled linseed oil; 1 pint of fuel oil. It is suggested that you ascertain the relative tensile strength of this sand by making some briquettes in the corebox made according to the blueprint sent you.

Metal Preparation

All heats poured under observation of the director were quite hot and quiet, showing no sparkling and cupping satisfactorily. Apparently the gas had a good opportunity to escape and no tendency of any mold to kick was noted. Little slag was observed on the metal in the shank ladles and less than was noted last summer. A poor type of skimmer was used, but the men were using it diligently.

It was interesting to learn that your present furnace lining is made of ganister and the experience you find with this material will be interesting to all of the group members. It is not surprising that you find better results from your new ladle lining mixture consisting of six parts of ganister and one part of clay than you got from your former mixture. The linings have been considerably reduced in thickness, which, of course, lowers the cost.

Condition of Castings as Shaken Out

The sand was peeling well indeed and was blasted off without difficulty. Less dirt and slag appeared in your castings than was the case on a previous inspection. This probably is due to several factors, including a more satisfactory ladle lining, better attention to skimming and less tendency of the facing to cut and wash. The latter, no doubt, is due to a larger proportion of fireclay. Your brake-bands and castings from pattern No. — are much improved in appearance over the previous condition.

Some castings on your cleaning floor were poured with rectangular risers which could have been supplied readily with round risers. The latter are more effective. No shrink holes were found under any risers.

Generally speaking, the gating of your castings seems to have been carefully studied and to give very good results.

Judging alone from the appearance of your castings as they are shaken out of the flasks, thorough attention is not given to venting. Many castings of design that should be vertically vented show no sign of such vents. Every reasonable precaution should be taken regularly to permit the free escape of gas. Plants *Y* and *Z* are undoubtedly much more thorough in their venting practice than is your plant. Because of the nature of the product, your plant has more reason to look to this feature than does any other plant in the group.

Appearance of Castings Ready to Ship

Several holes in castings were anything but clean; in some instances an excessive amount of annealing scale and an occasional large lump which should have been removed were present. Castings were found on the welder bench having dirt and slag spots which had not been thoroughly chipped out previously as required in the inspection standards. These castings were shown to your chief inspector and he was urged to be more careful in this matter. Your staff of inspectors is sufficiently large to give you a more thorough inspection and a more satisfactory adherence to the group inspection standards than was evident.

Despite the criticisms just made a noticeable improvement is being effected in the thorough cleaning of castings in general so that the impression casually formed from a visit to your shipping floor is good. Attention paid to some details pointed out will further improve the situation and will reflect more creditably upon your shop inspection.

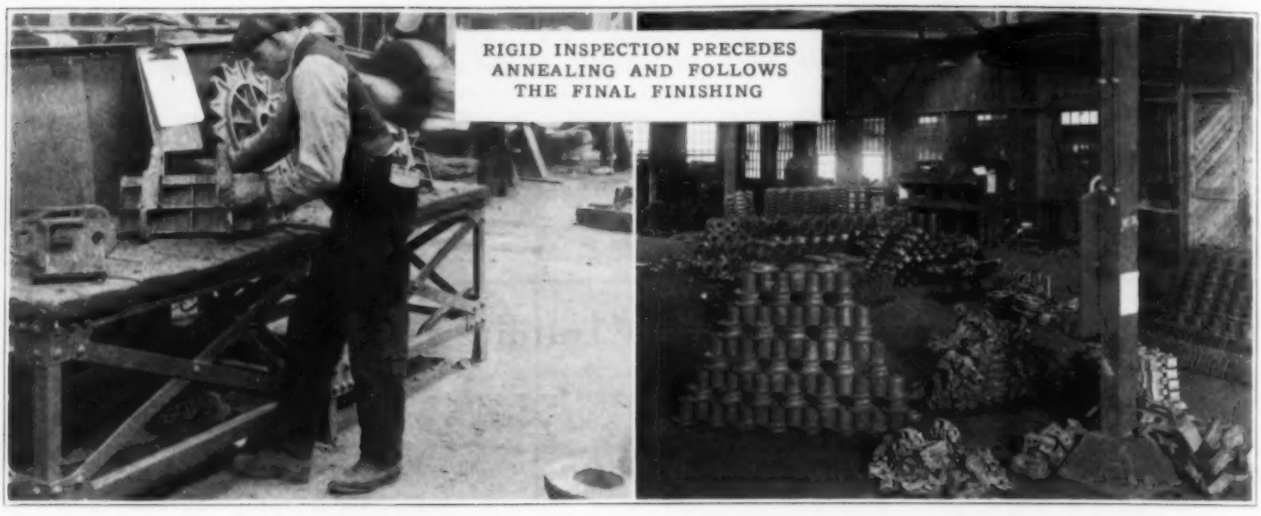
Miscellaneous

Never before was so much industry shown on the part of workmen as was noted on this trip. The snappy way in which the men poured the metal was particularly noticeable. This work was well organized, permitting the handling of the metal in a minimum period of time.

The new type of facing skids in use seem to be splendidly adapted for the purpose and might be duplicated at some of the other plants to advantage.

It may be worth while to remind you of a former suggestion that at an appropriate time your large annealer be redesigned to permit more economical handling of the castings. When that idea is developed by your works engineer attention wisely can be given to some means for lessening the excessive labor now entailed in loading the small annealing oven which is not equipped with a truck. A container for the castings annealed in the small oven could be lifted mechanically, thrust into the opening and later withdrawn without entailing a large expenditure for equipment. This work could be performed much more easily when operations are at a reduced stage.

The platform scale installed for weighing the heats was noted with great interest. The use of such a scale is well worth while since the management thereby secures data on losses of metal which make economies easier to effect.



RIGID INSPECTION PRECEDES ANNEALING AND FOLLOWS THE FINAL FINISHING

scrapped castings. When all the data from each plant are assembled, information is distributed from the director's office to the members in summarized form, giving each manager an opportunity to scrutinize the record of his performance in comparison with that of his associates.

Indicates Weaknesses

The composite analysis of defective castings is informative, indicating where efforts should be directed to cure the most pronounced evils. In transmitting the summary, the director appends his analysis or review of the report giving his comments covering the different items and the tendencies as they appear. This is done in a constructive manner and in a way to stimulate each organization to more efficient operation.

It will be seen that the report just mentioned refers to general operating conditions. This is supplemented by reports relating exclusively to each of the important operating departments. They are of such detailed nature as to prevent full explanation here. It requires little consideration to realize the value to each member of such information exchanged in a systematic way and presented in summarized form with an expert analysis. The information covering the furnace department shows the percentages of all metals charged and added in the furnace, represented by the weight of each commodity so used; the pounds of electrodes consumed per ton of charge; the average power consumption per ton of charge; the best furnace roof record and the life of the last previous roof; the average melting time per ton of charge; and the consumption of miscellaneous materials used for the furnace department. The molding and core reports cover many important items including the amounts of molding sand, core sand, fire clay and other commodities used per ton of product. The finishing report shows the tonnages cleaned and inventories of the tonnages in the cleaning room and in the shipping room. It also covers in detail the numerous operations of that important department to show the efficiency and economy in such items as welding and annealing. Any welding which may have been done by the consumer must be reported. Economies are suggested in such figures as the quantities of sandblast sand consumed per ton. A check on thorough finishing is made through reporting on this form any outside finishing charges allowed.

Graphic Charts Used

Periodically these monthly reports, which are summaries of the individual reports, are themselves summarized to show performances representative of an extended period for each member and for the group as a whole. Some of these reports are supplemented by graphic charts issued by the director conveying the information in an effective way.

Among the monthly reports submitted from the director is one that affords an interesting index to efficient chemical laboratory operations. This detail has been developed with such thoroughness by the group that an explanation of it may be interesting to some who might find it desirable to follow the same plan. Each member casts from each heat a plate of specified thickness from which clean drillings are taken. Drillings made within ¼-inch of the surface

SHOP CLEANLINESS AND DURABILITY OF REFRACTORIES ALIKE CLAIM ATTENTION

discarded. Each plant chemist makes routine determinations for the various elements from each plate. The carbon determinations are made by combustion, this method being found to be the most reliable. A record of the complete analysis is filed in the plant manager's office immediately after the plant chemist makes his own determinations, and each analysis plate is identified by the proper heat number and stored until the end of the month. At that time every plant manager selects one plate at random and has six lots of specimen drillings taken which are forwarded to the research director. Through a system of reporting each plant previously has transmitted to the director information as to its own routine analysis on every heat made.

Interchange Samples

When the director receives the six sets of drillings from each plant with information as to the heat number involved, he transmits to each plant laboratory a set of the drillings received from each of the other four plants. Secret key numbers known only to the director are assigned to each sample. Consequently the chemists who receive these drillings have no information permitting them to identify the sample drillings. The director holds two sets of drillings in reserve for possible rechecks or analysis by a commercial laboratory in case of a wide disagreement in results.

Each plant chemist, on analyzing the drillings from the other plants received through the director, makes a report to him which permits the preparation of a composite report showing the probable analyses of all the samples as estimated by the director. Using the probable or composite analyses as a guide the director then compares the original results submitted by each chemist as reported in the routine way and illustrates mathematically how accurately each chemist's work is performed. On the supposition that each set of routine analyses which has been checked in this manner typifies the accuracy of each plant's laboratory, a rank is assigned monthly by the director to each plant for accuracy in chemical analysis. Each plant receives from the director tabulated figures showing the manner in which the probable analyses were ascertained, a detailed report showing how each plant's analyses check with those from each other plant on the same samples, and a review of the month's work as thus typified conveying comments as to tendencies and suggestions as to possible improvement.

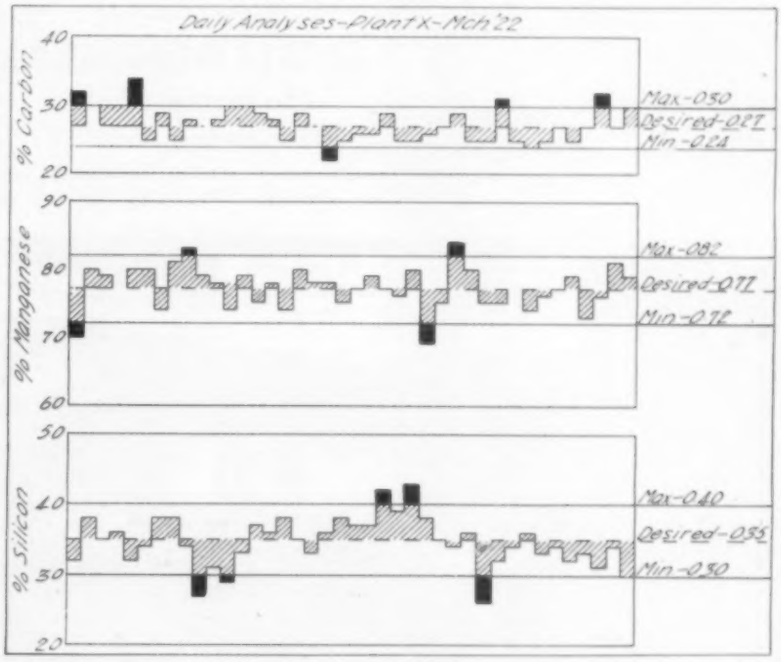
A tabulation prepared to show the manner in which the discrepancies are figured and by which relative rank is ascertained accompanies this article. This tabulation does not illustrate an actual performance and is only typical as to the method described. The effect on the chemists of the regular transmission of such reports to the plant managers is highly stimulating, and produces a healthy rivalry to attain accuracy.

Another report which is forwarded monthly by the director to each plant manager affords a satisfactory method of gaging accuracy of furnace operation from the standpoint of uniform composition of steel. This is described in detail elsewhere. It would not be reliable if measures were not taken as indicated above to verify the accuracy of the work of the chemists.

To one not familiar with the manner in which the various reports and tabulated data are handled, it might seem that a considerable quantity of information would be distributed, scanned in a hasty manner, and put aside without receiving important consideration. This might be possible were it not for the manner adopted for following through to a completion each activity of the Group.

No undertaking is permitted to lapse through lack of interest. The visits and recommendations of the research director backed by the active attention of plant officials who discussed the items in each report with minor executives, is fruitful of immediate results. Frequent conferences are arranged between the principal officials of each company at which careful consideration is given to the im-

How Uniformity Is Checked



EACH foundry reports to the research director giving the results of its chemical analyses made for every heat. From these graphs are prepared monthly, one for each plant, copies being sent to all plants, so that the managers, metallurgists and melters may compare results. Six points variation is allowed between the maximum and minimum for carbon, and 10 points range for manganese and silicon, respectively. The variations from the averages sought are shown by the shaded areas, while the blackened portions indicate divergence outside the permissible ranges. This indicates readily the deviations from the prescribed limits, and permits a rapid calculation of the number of points outside, characterizing unsatisfactory furnace practice. The number of points outside, that is, the number of black areas, are added and divided by the total number of heats reported, giving a method of comparison and checking the composition control in each individual plant. In the carbon graph shown, which is typical as to method only and is not a chart made from actual results, 11 points are shown outside the limits, and the total number of heats is given as 40. The resulting percentage or score is 0.275. The fictitious graph for manganese shows 8 points outside the range and the result is 0.200; while the silicon chart shows 13 points outside with a score of 0.325. This would indicate that the melter showed greater skill in the control of manganese than he did in regulating either carbon or silicon. The tendency to obtain low silicon during the latter part of the period illustrated is clearly shown from the graph.

portant operating phases of the business. The closeness of the technical co-operation of the associated companies permits these conferences to bring to each plant the best judgment on the executives of all of the other firms, resulting practically in securing for each member plant, the abilities of the men in all the different organizations. The effect of the active interest of so many men in all the plants in each activity keeps alive all subjects which are touched upon in each report.

Of course, one of the duties of the director is to keep in touch with all technical matters that relate directly and indirectly to the operation of the member plants. Being free from routine operating duties he naturally can keep in closer contact with outside matters relating technically to the business that can a busy plant manager. Information of value is transmitted from the director to each operating head in considerable volume, apart from the regular and systematic reports. One plant frequently undertakes a research of its own covering some phase of its operations which makes an individual investigation advisable. As a result it frequently happens that an important principle is established at one foundry which can be usefully applied at one or more of the others. The close contact maintained permits information of this nature to be disseminated immediately and fully to all of the associated companies.

Foundry Detail Complicated

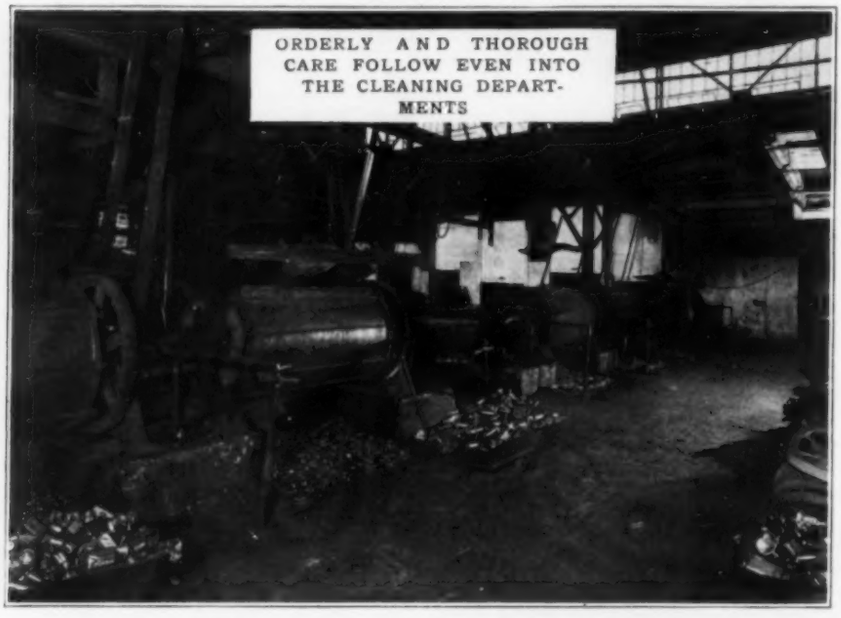
That the manufacture of small steel castings has many complexities will be realized by anyone who has read the foregoing.

The amount of detail involved in all phases of foundry practice is enormous, necessarily causing a considerable expenditure for labor, and requiring the closest scrutiny into the efficiency of each operation in order finally to give the customer a casting of the highest quality. In their efforts to do this, the group foundries have seen the great advantage of technical co-operation, and and constant study of improvement of methods of manufacture, undisturbed to unusual extent by the many conditions arising in the daily routine of operating staffs.

Australian Steelworks Are Modernly Built

(*Concluded from Page* 1558)

manufacture of wire netting and the finer wire products. Following on this an amalgamation of the Austral Nail company and the Australian interests of Rylands Brothers was effected under the name of Rylands Brothers (Australia), Ltd. Prior to the amalgamation, the Austral Nail company had been rapidly extending its mill for the production of all classes of plain wire and the manufacture of spring, coppered and galvanized wires, nails and barb wire, while Rylands brothers made large shipments to Australia of necessary equipment for a complete netting plant, now in operation. This plant has a capacity of 75,000 to 100,000 tons of mixed wire products per annum. The netting works will be capable of turning out 10,000 to 20,000 miles of netting per year. The whole works is designed on the most modern lines and will be able to deal with all the wire and wire netting requirements of the Australian market.



ORDERLY AND THOROUGH CARE FOLLOW EVEN INTO THE CLEANING DEPARTMENTS

Lysaght's Newcastle Works have been erected for the manufacture of black sheets, galvanized plain sheets and corrugated sheets, and no expense has been spared to make the plant modern in every respect, and equal to any in the world. Foundations have been put in for eight sheet mills, two of which are now in operation, and local labor has been drafted to learn the system, so that other mills may be started. The mills are driven from a direct current motor of 1300 kilowatts coupled to which is a flywheel of 34 feet diameter, weighing 160 tons. The power is purchased from the Newcastle electric supply department, which supplies at 6600 volts, 3-phase, 25 cycles. Transformers have been installed to reduce the voltage to 375 volts, for which the rotary converter was designed, and here the current is converted from alternating to direct.

The whole of the electrical apparatus for the mill motor was manufactured by the Metropolitan-Vickers Co., of Manchester, Eng.

The close annealing furnace is of the continuous type, is gas fired and will deal with 500 tons of sheets per week. In the pickling department a machine has been installed so that the picklers are not continually in contact with the acid fumes. The galvanizing department has been designed to accommodate three pots, one of which is in operation, and the finished galvanized sheet is of excellent quality, and exceeds expectations. The corrugating machine is of the rotary type, and will deal with 450 tons per week.

Standardizing Houses for Company Workmen

(*Concluded from Page* 1559)

built within the smallest cubage, yet each one meets all the necessary furniture requirements and shows the highest efficiency percentage.

We have also adopted many standards which tend to reduce the cost of the house. We have a standard ceiling height for each floor, standard windows and doors, standard wood trim for the inside of the house, standard hardware, and in fact we hope ultimately to have everything so standardized that only a very brief specification will be necessary.

One of the most important questions now confronting employers who have housing developments is the matter of obtaining adequate rentals. I have heard of very few developments in which the rents are producing anything like a fair return. This has two bad effects: It discourages outside capital from building, because it cannot compete with the low rentals; secondly, it tends to influence the employe against purchasing and owning his home.

The home owning plan established by the Steel corporation has been the means of many employes buying their homes.

Foundry Employs Electricity for Melting and Annealing

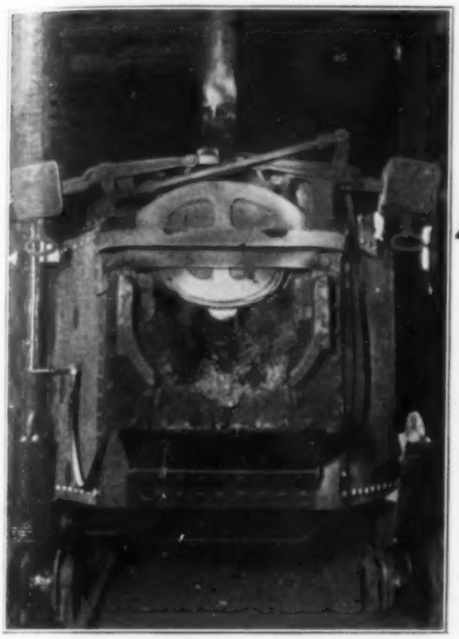


Fig. 1—Pouring side of the furnace. The door is furnished with a cooling coil

Description of Units Employed by Eastern Manufacturer Shows Electrical Equipment Effects Economies

BY HERBERT R. SIMONDS

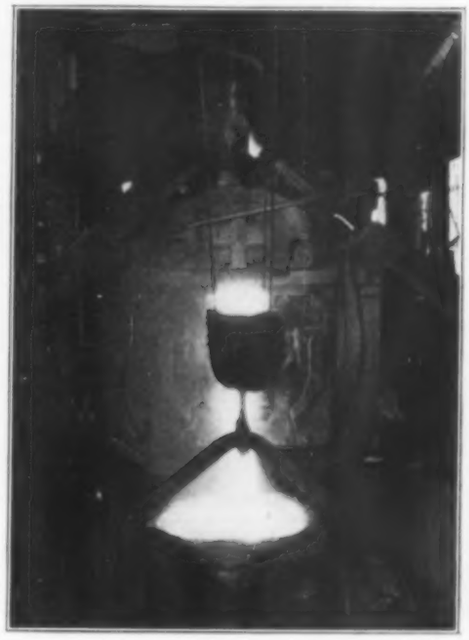


Fig. 2—Metal from the furnace is poured into large ladles carried by overhead cranes

INTRODUCTION of electrical apparatus in the foundry has been left largely to the equipment manufacturers, who in many cases have had the double duty of persuading the foundryman to buy and then the electric company to furnish power. Of course this applies only to electric furnaces, which in the early stages of their development produced objectionable surges on the power company's lines. Improvements in design of auxiliary electrical equipment practically have eliminated surges on the outside lines, but there are still some problems to be solved in conection with the furnishing of electric power to operate a furnace in a foundry.

Questions arise as to what voltage the power company is to furnish the customer. The distributing line usually carries 2300 volts or higher, and the furnaces ordinarily are rated at 120 volts or less. If step-down transformers are furnished by the power company, the current is metered on the low side and the losses through the transformers are borne by the power company. If the transformers are furnished by the customer, meters are placed on the higher voltage line and the customer stands the losses. Advantages are evident to both of these plans of metering, but despite the fact that in the second case the customer not only pays for the transformers, but continually pays for the losses through these transformers, this arrangement has so much in its favor that it is almost universal practice today.

The use of electric furnaces in general, in foundries still is uncommon enough to give interest to each new installation. Electric furnace companies state that there now are less than 1000 iron and steel furnaces in actual service throughout the entire world. About one-third of this number, or 350 are in the United States. The growth in the use of electric furnaces, however, is shown from the fact that in 1913 there were only 19 furnaces in this country making iron or steel.

One of the most recent additions to the list of electric furnaces in foundries is the one at the Yale & Towne Mfg. Co., Stamford, Conn. After considerable study of the question, this company installed electrical equipment for making and annealing steel and iron castings. The annealing oven is shown in Fig. 5, and the furnace in Fig. 1. This 1½ ton furnace, manufactured by the Booth Electric Furnace Co., Chicago, is built on rockers which rest on rollers, thus providing an easy means of tilting. The tilting motor, located on the wall side of the furnace, is operated by a push button on the panel. However, should it be necessary, the melter readily can tilt the furnace by means of a hand wheel. Fig 7 shows the arrangement of switchboard and furnace control. The transformers and other electrical equipment are in a separate room behind the switchboard.

This and other electric furnaces already have been described, in considerable detail, so that only a few of the outstanding features will be mentioned here. Both the charging and pouring doors are counterbalanced to facilitate operation. The pouring door is water-cooled and both doors are faced up with fire brick. The hearth is eliptical in shape, which makes it possible for the melter's helper to push the slag from the pouring door end, while the melter himself skims off this slag into a pit at the charging door end. The hearth of the furnace at the Yale & Towne foundry is sintered in with magnesite and slag, using about 8 per cent slag. The walls are built of magnesite and silica brick, one row of chrome brick being used for insulation. The roof is of silica splits and wedges and the electrode openings are of special silica forms which carry pockets to receive the water-cooling coils. A spare roof always is kept at hand in case an accident should happen to the roof when in use. Control of the electrodes is either automatic or by push button from the switchboard. The

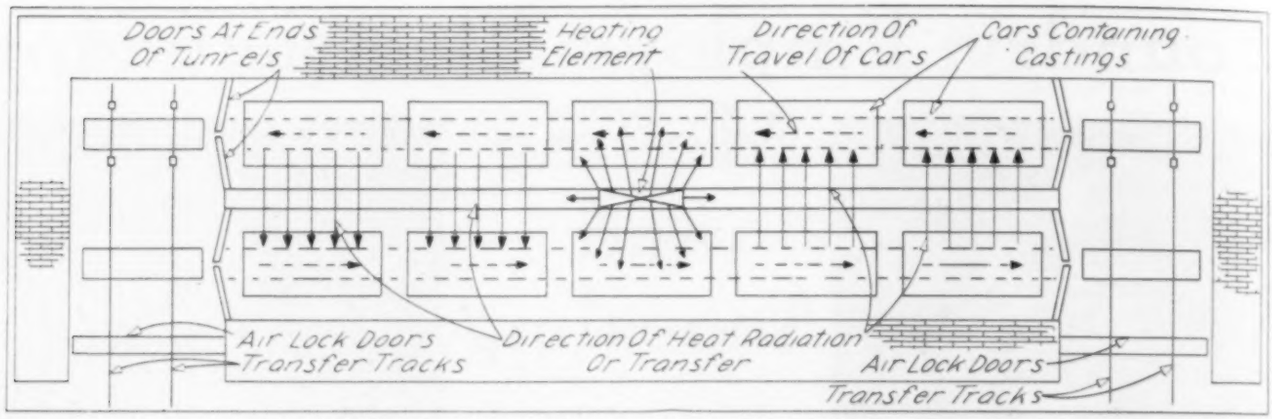

Doors At Ends Of Tunnels
Heating Element
Direction Of Travel Of Cars
Cars Containing Castings
Air Lock Doors Transfer Tracks
Direction Of Heat Radiation Or Transfer
Air Lock Doors Transfer Tracks

FIG. 3—BY HAVING TWO PARALLEL TUNNELS, HEAT FROM THE CASTINGS WHICH ARE COOLING IN ONE TUNNEL IS UTILIZED IN PREHEATING THE UNANNEALED CASTINGS IN THE OTHER

ELECTRIC FURNACE REPORT

DATE ..... 19 ..... SIZE OF HEAT ..... HEAT NO. .....
TRANS. TEMP. START ..... FINISH ..... DEGREE RISE .....
METER START ..... FINISH ..... K. W. USED .....
CONDITION OF ROOF ..... LINING ..... BOTTOM .....
NO. OF FIRST HEAT OF PRESENT ROOF ..... OF PRESENT LINING .....
NOS. OF ELECTRODES USED ..... NIPPLES USED .....
POWER ON ..... OFF ..... TIME ..... HEAT TAPPED .....

METALS	WEIGHT	NON-METALS	WEIGHT
SPILLS & SKULLS		GANISTER	
SPRUES		SILICA SAND	
LOCK STOCK		FIRE CLAY	
SKELETON		COKE	
PUNCHINGS		LIME	
TURNINGS		FLUORSPAR	
CHAIN			
FERRO MANGANESE			
FERRO SILICON			
IRON ORE			
ALUMINUM			
TOTAL		TOTAL	

REMARKS .....

HEAT ANALYSIS

	CARBON	SILICON	MANGANESE	PHOSPHORUS	SULPHUR
SPECIFICATIONS					
PRELIMINARY					
PRELIMINARY					
FINAL					

MELTER .....

FIG. 4—BEFORE EACH HEAT, A CHARGE SHEET IS MADE OUT GIVING A LIST OF THE VARIOUS ELEMENTS REQUIRED AND OTHER DATA

water-cooled grips for holding the electrodes can be opened and closed from the floor, which entirely overcomes the former occasional necessity of requiring the melter to work from the roof.

The operation of an electric furnace in a foundry is largely a question for each melter to work out for himself. The practice in any one plant, however, furnishes a guide for that in other plants. At the Yale & Towne foundry the operation centers about a form such as shown in Fig. 4, which is figured out by the melter previous to each charge. The various elements required are estimated from previous chemical analyses of the backstock and scrap to be used in the heat. The charge consists of 40 to 45 per cent backstock, the balance being made up of scrap. The furnace is charged at the rear end of charging door, the heavy pieces being put in first, and the lighter material used to fill up the spaces and openings. When the charging has been completed the three electrodes are lowered by means of push buttons until within an inch of touching the charge. The doors then are closed and all valves for the water cooling devices opened. When this is done and the furnace is otherwise seen to be in readiness, the switches for the automatic feed for the electrode are closed. Immediately the electrodes begin to feed downward until they come in contact with the charge. From this point until the first sample is taken, the melter exercises no control over the furnace operation except that he keeps his attention on the volt and ammeters, from which instrument irregularities can be detected quickly. Occasionally loose pieces of scrap may be raked in to help the bath in the molten state. As soon as the charge is melted, a sample bar is cast for the carbon analysis. To make this test bar, a cast steel spoon first is dipped in the slag on top of the steel until it is completely coated. This is done to prevent the steel from skulling in the spoon and sticking to it. The spoon then is inverted and forced down into the bath, turned upright again and brought out with the sample of steel in it. The test bar itself is cast in a sand mold to prevent chilling. As soon as possible samples from this bar are hurried to the chemical laboratory and the results of the carbon analysis are back to the melter's in approximately 10 minutes.

One detail to consider in connection with this analysis is guarding against particles of sand being included with the sample and thus throwing off the results. By carefully picking up the borings with a magnet, this danger is overcome.

Immediately after taking the first test the melter pulls the phosphorous slag. He cannot afford to lose any time at this moment as the phosphorous goes into the slag at a relatively low temperature and the action is reversed if the bath becomes too hot. The sulphur slag now is added and from here on the metal is in a reducing condition. To help maintain this condition often it is desirable to scatter coke breeze over the slag at short intervals. When the metal has reached something near the pouring temperature, the melter takes a further test for carbon and manganese. At this time a temperature test also is made. This latter is done by snapping a stop watch as the spoon comes out of the bath and then observing it for a film covering to appear on top of the sample. The time interval in this determination of course depends upon individual conditions. However, with given conditions a definite time for film covering to appear indicates within a narrow range the temperature of the iron. At the Yale & Towne foundry, should the film appear in 30 seconds, the steel is known to be cool and the heat is continued until the film appears in 50 to 55 seconds.

During the alloted time, the final analysis is made and the results are in the hands of the melter in time to make any necessary ferroalloy additions, after which the steel is poured

e pouring operation is shown in 2.

The furnace just described is used making steel and malleable iron stings. A large part of these must annealed and this also is done electrically. The castings, most of which small, are picked up from the undry floor and placed in steel trays shown in Figs. 5 and 6. These trays are designed to permit both radiation and circulation of air currents below and between them. The trays are collected by small electric hoist trucks as shown in Fig. 6, and are carried to the annealing oven.

The operation of this oven is unusual somewhat and a description of its general construction will be necessary before the cycle can be explained. The oven is manufactured by the Electric Furnace Construction Co., Philadelphia, and is equipped with General Electric Co., Schenectady, N. Y., nichrome registers, giving an annealing capacity of 20 tons per 24 hours at a temperature of 1450 degrees Fahr. The oven unit consists of two parallel tunnels each equipped with tracks. Cars travel in opposite directions in the two tunnels. Five cars are located in each tunnel and the heating elements are situated on the walls opposite the middle car only. An air lock is provided at each end of the tunnels outside of the main doors to prevent circulation of air when the furnace doors are raised for shifting the cars. An extra car is provided so that it may be loaded or unloaded while the furnace has both tunnels in full operation. Transfer tables are installed at both ends of the parallel tunnels. By having the direction of travel opposite in the two tunnels, advantage is taken of the heat given off from the castings during cooling. A description of the operation will show this.

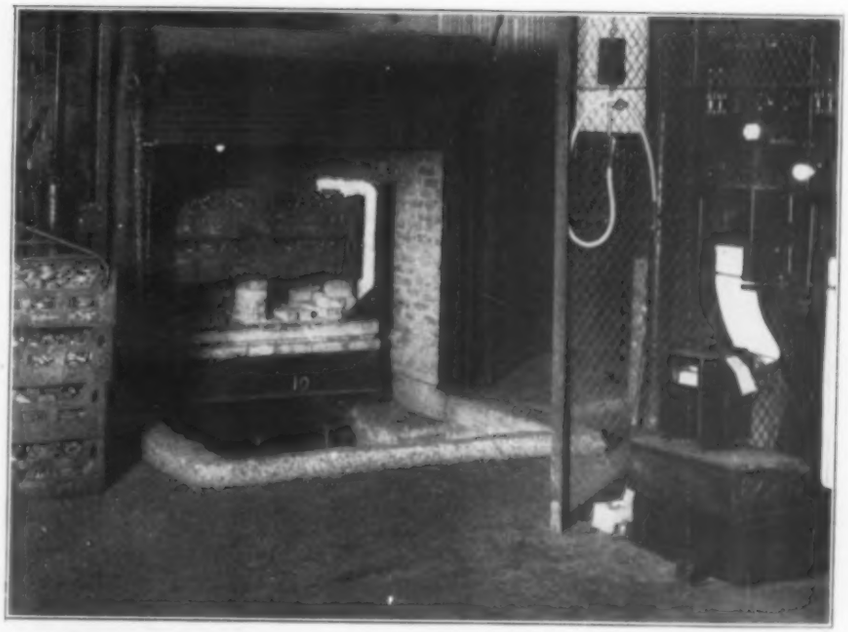


FIG. 6—ONE END OF THE ANNEALING OVEN SHOWING CAR ON THE TRANSFER TABLE. AT THE LEFT ARE THE TRAYS OF UNANNEALED CASTINGS

The steel trays loaded with castings to be annealed are stacked three high on the small cars which operate in the oven. Assuming that both tunnels are loaded, the procedure is for the extra car to be loaded and pushed into the air lock to a point opposite the entrance to one of the tunnels. The air lock then is closed. The tunnel door is raised and the car pushed into the tunnel by a motor-driven screw pusher which pushes a car out of the other end of the tunnel to the transfer table, and incidentally moves all of the cars up one stage. The

FIG. 5—CASTINGS ARE BROUGHT TO THE ANNEALING OVENS ON SMALL ELECTRIC TRUCKS EQUIPPED WITH HOISTS

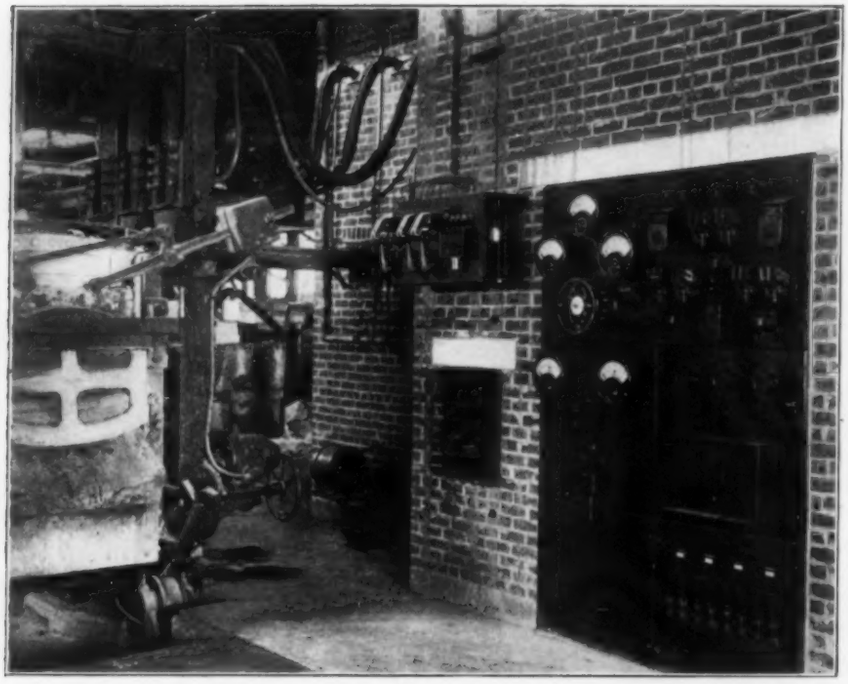


FIG. 7—THE SWITCHBOARD IS CONVENIENTLY LOCATED AND THE FLOOR SPACE IS UNOBSTRUCTED

movement is called a shift, these are made normally every hour, first in one tunnel and then in the other. The car which is forced onto the transfer table is removed from the air lock, unloaded and reloaded with annealed castings and then is ready for the next shift which as has been stated is in the other tunnel and in the opposite direction. From this it will be seen that the cold cars entering the furnace stand for several hours opposite the hot cars of annealed castings which are cooling in the adjacent tunnel. In this way much of this heat is absorbed which otherwise would be wasted. By making one shift per hour, first in one tunnel, and then the other, each car is allowed to remain two hours in each position. Four hours therefore is provided for warming up, due to the heat transfer just described, then two hours of heating in the central heating zone, and finally another four hours cooling, during which time heat transfer in the opposite direction takes place.

The temperature in the heating zone in each tunnel is regulated by a control, produced by Leeds & Northrup Co., Philadephia, and is protected by hot fuses which prevent the temperature rising above above 1900 degrees Fahr.

The section of the Yale & Towne foundry given over to electric casting and annealing furnishes an excellent example of what may be accomplished in the use of electricity in a foundry. Here all equipment is operated electrically. The foundry uses the step down transformers and is metered at 2300 volts.

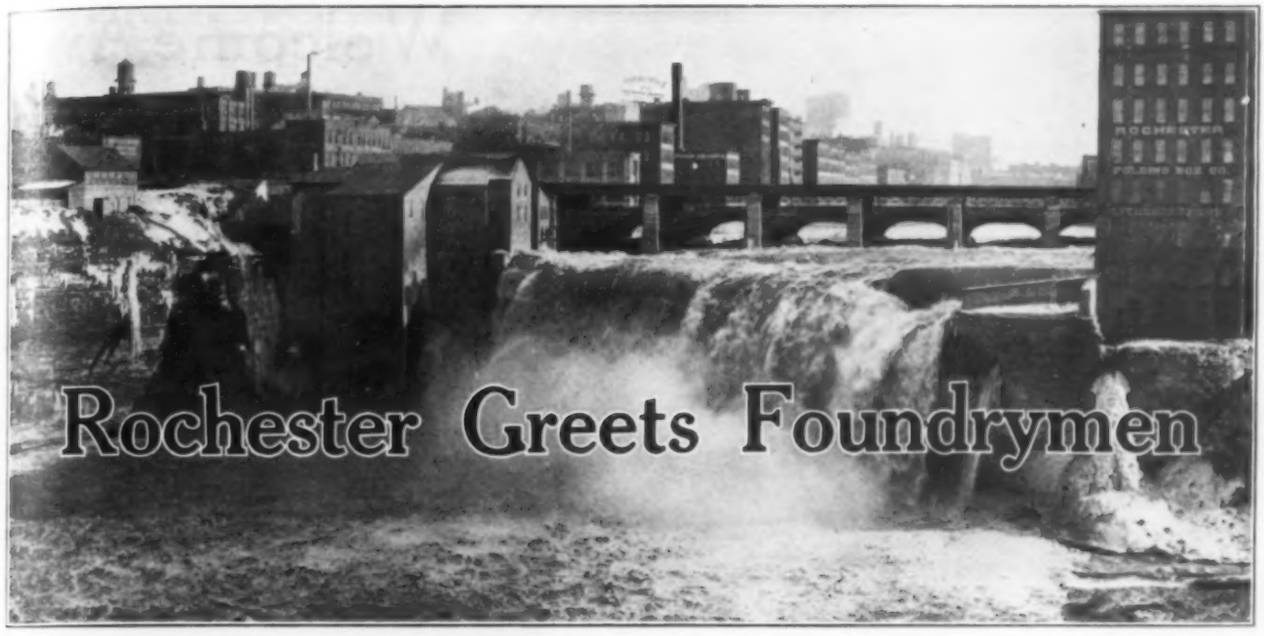
Plan Tube to Staten Island

Plans for the construction of a freight and passenger tunnel between Brooklyn and Staten Island have been approved by the board of estimate of New York city. The latter also has appropriated $580,000 covering the services of the city engineers in drawing the plans. The board shortly will take the necessary steps to obtain the consent of the secretary of war for the construction of the tunnel. It is estimated the project will entail an expenditure of approximately $60,000,000.

Issues Ore Booklet

The Tod-Stambaugh Co., Cleveland, shippers of Lake Superior iron ores, has issued its booklet for 1922, giving the average analyses of its ores from the Mesabi, Cuyuna and Menominee ranges. The booklet lists 11 standard grades of bessemer and nonbessemer ores.

FIG. 8—A VIEW ACROSS THE TRANSFER TABLE SHOWING THE ENDS OF BOTH TUNNELS. THE AIR LOCK CURTAIN IS IN THE FOREGROUND

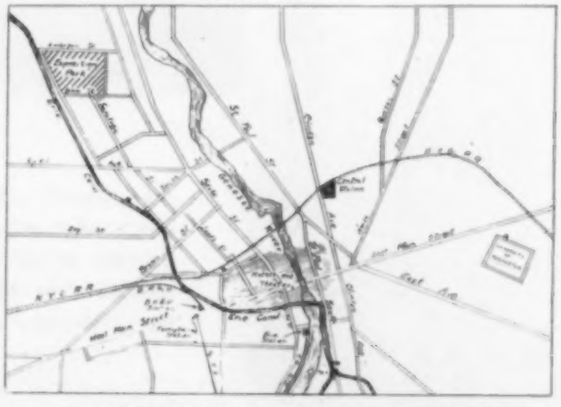


Rochester Greets Foundrymen

All Is in Readiness for Twenty-sixth Meeting of American Foundrymen's Association, June 5-9—Event Will Mark Passing of Industrial Depression of 1920, 1921

AFTER a lapse of nearly two years and under circumstances made auspicious by the rising tide of business, American foundrymen are about to assemble for the twenty-sixth meeting of the American Foundrymen's association. From June 5 to 9, inclusive, the technical sessions and the exhibit of foundry, machine shop and woodworking equipment and supplies will be held at the municipally-owned Exposition park at Rochester, N. Y.

The approaching convention promises to reflect tangible evidence of the return of prosperity in the foundry indutsry. Any doubt that may have existed last January, when the initial plans for the 1922 meeting were formulated, long since has been dissipated by the unusually hearty co-operation and interest shown by foundrymen and equipment manufacturers in next week's event. Not only will the technical program exceed those of previous meetings in point of variety of subjects and excellence of papers, but the exhibit will compare favorably with many of former years in size and will be superior in the diversity of equipment and products displayed. Visiting foundrymen are almost sure to admit before the week has passed, that the last moment shift from Cleveland to Rochester, as the place of meeting, was a most fortunate move. Rochester affords facilities for the convention that in many respects are ideal. It is conveniently located for the delivery of exhibits from the principal equipment manufacturing centers and is easily accessible by railroad to foundrymen from the industrial districts of a large portion of the United States and Canada. It also is accessible from many points by automobile.



MAP SHOWING PRINCIPAL STREETS IN ROCHESTER AND LOCATION OF EXPOSITION PARK

In view of the universally recognized merit of the plan followed in 1920 at Columbus, whereby the technical sessions and exhibits were held in adjacent buildings, the similar arrangement provided at Exposition park is sure to meet with approval. As shown in the accompanying map, Exposition park is slightly over a mile from the hotel district, and may be reached by street car in about 10 minutes. The exhibits will be held in three large buildings, connected and adjacent to the auditorium where the technical sessions will be held. A diagram, showing the number of exhibition booths and their location in the various buildings is presented on page 1578.

In accordance with the policy adopted several years ago, the technical program, containing over 40 papers, is international in character. So successful have been the plans for exchanging papers with the leading foundry organizations of Europe, that this year the American Foundrymen's association is able to present no fewer than six important technical papers through the courtesy of British, French and Belgian foundry societies.

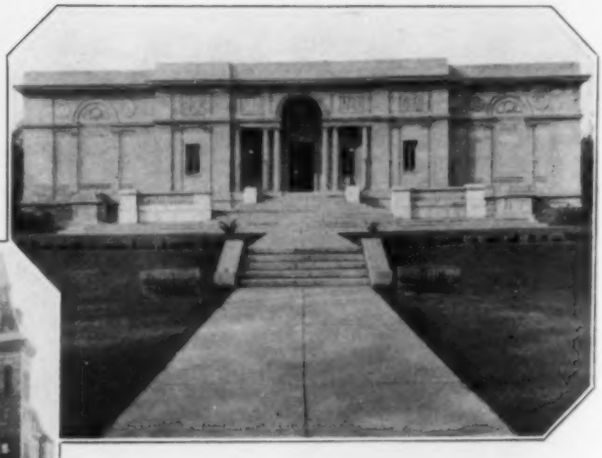
Welcome Awaits

A Few of Rochester's Many

Broad streets make the business district pleasing

Three waterfalls on the Genesee attest the power resources of the city and add a measure of scenic beauty and attractiveness

Many residences are of unusual attractiveness



Rochester's public buildings possess a simple dignity and effective style—At the left is the court house and above is shown the Memorial art gallery on the University of Rochester campus

A. F. A. Visitors

and Varied Points of Interest

Practically all electric lines reach Main street

High architectural standard is evidenced even in the manufacturing buildings

Many interesting parks are within easy access by street car

Five steam and five electric lines reach the city—One of the railway stations is shown above—At the right is one of the armories of which two are maintained in Rochester by the state

A number of these papers have been grouped for presentation at an "International" session to be held Tuesday morning, June 6. The feature of this meeting, which is the opening technical session of the convention, will be the exchange paper of the Institution of British Foundrymen. F. J. Cook, Rudge-Littley, Ltd., West Bromwich, England, will present the paper in person. Mr. Cook arrived in New York in May, and is on a tour of the leading foundry centers of the United States.

As shown by the condensed program on this page, there will be two sessions on steel foundry problems, one on general and gray iron foundry questions, one on industrial relations, one on malleable iron practice, one on molding sand research, and one joint session on nonferrous practice, with the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers. Separate sessions of the latter organization also will be held Tuesday morning and Wednesday afternoon.

The opening meeting on Monday afternoon will be a joint non-technical session under the auspices of the American Foundrymen's association and the Institute of Metals division. The final meeting, scheduled for Friday morning, will consist of a technical session on malleable iron problems, followed by a business session. The intermediate sessions are arranged so that there is little likelihood of conflict, not more than two simultaneous sessions being scheduled at any one time.

Entertainment Features Offered

The program provides for an unusually liberal quota of entertainment features. In addition to the traditional and always brilliant banquet, which on this occasion is scheduled for Wednesday night at the Powers hotel, there will be a boat ride on Lake Ontario Thursday afternoon. Inspection trips to plants in Rochester will be arranged, and ample provision for the entertainment of visiting ladies is promised by the entertainment committee.

Rochester fundamentally is a city of homes. Its industries are those which demand the highest type of intelligent workmen, and its executives all seem imbued with the feeling which made the old time close knit organization with its close personal association the model which modern welfare activities seek to follow. This human interest, the close contact of manager and man and the mutual respect for the high calling of each, has set up this elusive but strongly evident *Rochester spirit*.

The Bausch & Lomb Optical Co. is typical of the industries of Rochester. Employing approximately 4000 people, with almost 25 acres of floor space, close contact is maintained between the officers and employes, and the sincere understanding which exists is remarkable in so extensive an institution. Unique in its product and its management, this concern boasts a veterans club of 200 members who have been employed with the company for over 25 years. John J. Bausch, America's pioneer manufacturer of optical goods is 91 years old; yet each day he takes his place in a small shop on the upper floor, and exercises a kindly paternal influence in the affairs of the whole institution.

Condensed Program

Monday, June 5

10:00 a. m.—Registration, building No. 3, Exposition park.
10:00 a. m.—Opening of exhibit, Exposition park. Exhibits remain open until 5 p. m.
2:00 p. m.—Opening joint session, American Foundrymen's association and Institute of Metals division of the American Institute of Mining and Metallurgical Engineers.

Tuesday, June 6

9:00 a. m.—Exhibits open.
9:30 a. m.—International technical session, auditorium, Exposition park.
9:30 a. m.—A. I. M. E. Metallography Session.
2:00 p. m.—Nonferrous session A. F. A.
2:00 p. m.—Steel session.
7:00 p. m.—Exhibits open and remain open until 10:00 p. m.

Wednesday, June 7

9:00 a. m.—Exhibits open until 5:00 p. m.
9:30 a. m.—Steel session, auditorium.
9:30 a. m.—Gray iron session.
9:30 a. m.—Nonferrous session held jointly by the A. F. A. and the institute.
2:00 p. m.—A. I. M. E. brass foundry session.
2:00 p. m.—Industrial relations session, auditorium.
7:00 p. m.—Annual banquet, Powers hotel, Rochester.

Thursday, June 8

9:00 a. m.—Exhibits open until 5:00 p. m.
9:30 a. m.—Molding sand research session, auditorium, Exposition park.
1:00 p. m.—Boat ride.

Friday, June 9

9:00 a. m.—Exhibits open until 5:00 p. m.
9:30 a. m.—Malleable session, followed by business session, auditorium.

Everyone who has heard of Rochester thinks *kodak* by reflex, and, such is the merit of advertising, the name of the company which is coupled with this term follows closely. Under the prestige of this company's output, Rochester leads the world in the production of cameras, films, and other photographic supplies. The firm previously mentioned at some length establishes the city's claim to first place in the manufacture of optical goods. Thermometers, check protectors, filing devices and office systems, soda fountain supplies, and mail chutes, in which first place on the production chart is claimed, constitute another count toward the title of the City of Varied Industries. Other materials and finished articles which appear in the list of manufactures read like the index of a mail order catalog. A hasty enumeration will suffice: Automobiles, equipment and parts for automobiles and trucks, machinery, electrical supplies and equipment, trunks, stoves, stamped metal ware, perfumes, furniture, tools, dental chairs, jewelry, castings, candy, paper boxes, beds, carbon paper, type-writer ribbon, ivory buttons, shoes, mens clothing, railway equipment, laundry machinery railway signalling devices, tools and many other smaller industries which go to make up a total of 350 commodities from 1650 different factories. One of the most important branches of those manufactures enumerated, considered in the light of foundry operations is the building of railway equipment and signaling devices. The General Railway Signal Co. operates an extensive gray-iron, brass and aluminum foundry. Closely adjoining is the plant of the T. H. Symington Co., which embraces about six acres under one roof.

Produces Varied Line of Castings

The output of the latter institution consists of malleable-iron journal boxes and draft-gear attachments for both passenger and freight cars, and malleable castings for other railway equipment. The foundry is one of the largest exclusive malleable shops in the country, with its melting capacity of 45,000 tons of finished castings per year. The furnaces, each capable of handling two 26-ton charges per day are fired with pulverized coal supplied from a central station. The castings are annealed in 21 annealing ovens, each with a capacity of 80 tons. The average production of journal-box and draft-gear castings is sufficient to equip 36,000 cars annually. Donald S. Barrows, vice president in charge of operations, and George B. Pettingill, general purchasing agent of this firm are active in the preparations which Rochester is making for the entertainment of visiting foundrymen in June.

Machinery manufacture also plays an important part in maintaining the city's stand in the foundry world. The American Laundry Machinery Co. American Woodworking Machinery

Program of A. F. A. Technical Sessions

Monday, June 5

10:00 a. m.—Opening of exhibits
Registration

2:00 p. m.—Joint opening session, American Foundrymen's association and the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers

Tuesday, June 6

International Session

9:30 a. m.—Annealing of Gray Iron, by J. F. Harper and R. S. McPherron, Allis-Chalmers Co., Milwaukee.

European vs. American Molding Machine Practice, by E. Ronceray, president, Societe Anonyme des Etablissements Ph. Bonvillian and E. Ronceray, Paris.

Making Typewriter Frames in a Belgian Foundry, by Joseph Leonard, president, Association Technique de Fonderie de Liege; Herstal, Belgium.

Destruction and Reconstruction of French Foundries, a memoir submitted by the Association Technique de Fonderie de France.

Cupola Melting Tests with Mixtures Changing During Run, by Richard Moldenke, Watchung, N. J.

American vs. British Cast Iron, by F. J. Cook, Rudge-Littley, Ltd., annual exchange paper of the Institution of British Foundrymen

Steel Session

2:00 p. m.—Side Blow Converters for Steel Foundries, by T. Levoz, Association Technique de Fonderie de France

Tests with Cerium as a Deoxidizer and Desulphurizer in Red Brass, Cast Iron and Converter Steel, by L. W. Spring, Crane Co., Chicago.

A Study of the Change of Grain Size of Silica Sand Through the Constant Addition of Clay, by R. J. Doty, Sivyer Steel Casting Co., Milwaukee.

The Preparation of Steel Foundry Sand, by S. H. Cleland, National Engineering Co., Chicago.

Accurate Control of Analyses in Acid Electric Steel Furnaces, by A. C. Jones, Electric Steel Co., Chicago

A. F. A. Brass Foundry Session

2 p. m.—Technical Control of McCook Field Foundry, by E. H. Dix Jr., McCook Field, Dayton, O.

Selection of Fuels and Furnaces for Melting Copper and Brass Alloys, by T. H. A. Eastick*

An Investigation of Segregation With a View to Preventing Its Occurrence in Castings Made of High-Lead Bronze, by R. E. Lee and F. B. Trace, Allegheny college, Meadville, Pa.

Brass Forgings, by C. G. Heiby, Mueller Metals Co., Port Huron, Mich.

Two-Part Castings Made in Three-Part Molds, by W. H. Parry, Brooklyn, New York

Nickel, its Metallurgy, Properties and Uses, by W. M. Corse, Secretary, Institute of Metals Division, A. I. M. M. E.

*Deceased.

Wednesday, June 7

Steel Session

9:30 a. m.—A New Electric Furnace, by R. Sylvany, Association Technique de Fonderie de France

When and Where the Foundry Should Use Electric Heat, by E. F. Collins, General Electric Co., Schenectady, N. Y.

Impact Tests on Steel, by F. C. Langenburg, Watertown Arsenal, Watertown, Mass.

Progress in Open-hearth Process, by Willis McKee, of Arthur G. McKee & Co., Cleveland

Report of committee on specification for steel castings.

A Managerial Study of Oxy-Acetylene Cutting and Welding in Foundries, by G. O. Carter, consulting engineer, the Linde Air Products Co., New York.

Joint A. F. A. and A. I. M. M. E. Aluminum Session

9:30 a. m.—Cracks in Aluminum-Alloy Castings, by R. J. Anderson, bureau of mines, Pittsburgh.

The Effect of Impurities on the Oxidation and Swelling of Zinc-Aluminum Alloys, by M. M. Pierce and Mr. Brauer.

Aluminum and Aluminum Alloy Melting Furnaces, by R. J. Anderson, bureau of mines, Pittsburgh

Melting Aluminum for Rolling Into Sheets, by J. A. Lange, Western Springs, Ill.

General and Gray Iron Session

9:30 a. m.—A Study of the Weight of Iron Castings, by J. D. Wise, University of Illinois, Urbana, Ill.

Electrically Heated Metal Patterns, by C. A. Cremer, Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

Flask Equipment for Molding Machines, by Arnold Lenz, Saginaw Products Co., Saginaw, Mich.

Design of Geared Ladles, by A. W. Gregg, Whiting Corp., Harvey, Ill.

Investigations Relative to Insulated Core Oven Design and Performance, by C. F. Mayer, Ohio Body & Blower Co., Cleveland

Electric Cranes in Foundry Service, by A. H. McDougall, Whiting Corp., Harvey, Ill.

Technical School Foundries, by J. D. Hoffman and R. E. Wendt, Purdue University, Lafayette, Ind.

Report of A. F. A. subcommittee on specifications for cast-iron wheels

Memorial on Corrosion of Cast Iron, by H. Y. Carson, American Cast Iron Pipe Co., Birmingham, Ala.

Report of committee on specifications for gray iron castings.

Industrial Relations Session

2:00 p. m.—Report of A. F. A. committee on safety, sanitation and fire protection.

Cycles of Depression and Their Prevention, by Ernest F. Du Brul, general manager, National Tool Builders' association, Cincinnati

Prevention of Waste in Industry, by L. W. Wallace, executive secretary, The Federated American Engineering societies, Washington.

Time Study and Job Analysis in the Foundry, by A. J. Kramer, Deering Works, International Harvester Co., Chicago

Report of A. F. A. Committee on Costs.

Eye Protection and Safe Clothing in the Foundry, by Buell W. Nutt, The Safety Equipment Service Co., Cleveland.

Thursday, June 8

Molding Sand Research Session

9:30 a. m.—Establishing a Method of Testing for Green Bonded Strength, by R. J. Doty, Sivyer Steel Casting Co., Milwaukee

Significance of Screen Test of Molding Sand, by H. A. Schwartz, National Malleable Casting Co., Cleveland

Reports of joint committee of American Foundrymen's association and National Research council committee on molding sand research

Friday, June 9

Malleable Cast Iron Session and General Business Session

9:30 a. m.—The Manufacture and Properties of Refractories for Air Furnaces, by C. E. Bales, Louisville Fire Brick Co., Highland Park, Ky.

The Behavior of Fire Brick in Malleable Furnace Bungs, by H. G. Schurecht, bureau of mines, Columbus, Ohio

A European View of the Malleable Problem, by T. Levoz, Association Technique de Fonderie de France

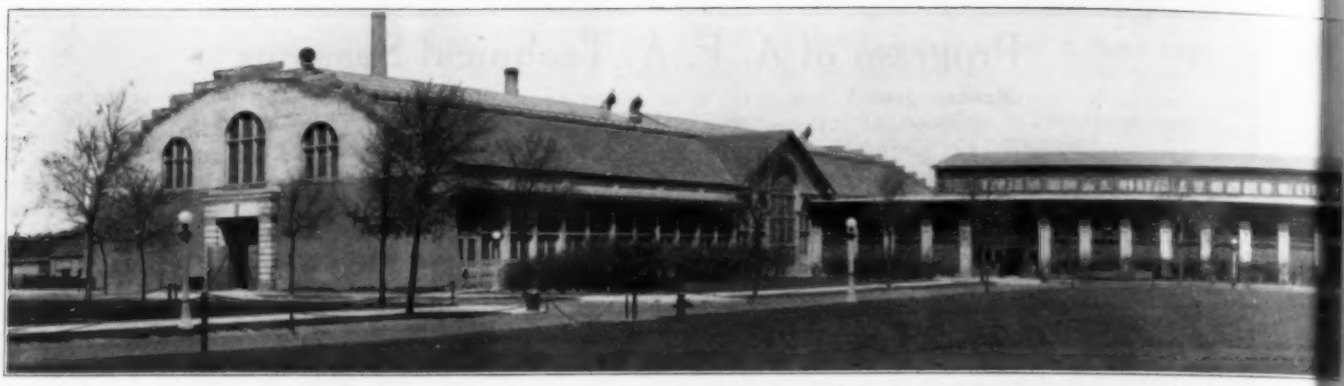
Use of Carbon Dioxide Recorders in Controlling Combustion of Powdered Coal, by D. M. Scott, The T. H. Symington Co., Rochester, N. Y.

Use of Pulverized Coal for Malleable Foundries, by E. E. Griest, Chicago Railway Equipment Co., Chicago

Report of committee on Malleable Castings specifications.

The Relation of Temperature to the Form and Character of Graphite Particles in the Graphitization of White Cast Iron, by E. J. C. Fisher, Atlas Die Casting Co., Worcester, Mass.

The Influence of Temperature and Composition on the Graphitization of White Cast Iron, by A. E. White and H. E. Gladhill, University of Michigan, Ann Arbor, Mich.



A general view of the exhibition hall at the municipally-owned Exposition park, Roches

Co. and the Gleason Works stand out strongly in this regard. The latter is a large producer of machine tools and possesses an exceptionally well designed plant.

The industrial standing of the city may be traced directly to its natural power facilities, and its location with reference to water transportation. The Genesee river with its series of three falls within the city limits gives a combined drop of 267 feet and develops over 50,000 horsepower which is utilized to the fullest extent in driving industrial machinery. Further, the same river provides a natural port with ready access to Lake Ontario. In fact, the river has exercised an important influence in the history and development of Rochester.

All of the varied industries which have been noted in a sketchy fashion in this article will hold points of interest to those who attend the convention, and opportunities will be offered to become familiar with some of the exceptional attractions of the city and vicinity. Rochester has an extensive park system of eight units including three parks on Lake Ontario and three others on the Genesee river. Exposition park, where the exhibition and technical sessions of the American Foundrymen's association will be held, is unique among municipally controlled enterprises. It was acquired by the city through the purchase of an industrial prison and was extended and improved until with its 42 acres, nine large buildings including museum, library and shop school, it comprises a year-round recreation center of unusual merit. The exposition park is just eight minutes ride from the downtown section.

Other outlaying points of interest which may be reached by automobile or electric railway include Glen Haven and Sea Breeze, two summer resorts on Irondequoit bay, and Ontario Beach park, on Lake Ontario.

Rochester Convention Committees

Executive Committee

Norman Van Voorhis, chairman	Galusha Stove Works.
P. B. Van Deusen, Secretary	Rochester Chamber of Commerce.
Schuyler H. Earl	Gleason Works.
Matthew Elliott	Erie Foundry Co.
H. G. Hetzler	North West Foundries, Inc.
A. H. Jones	American Wood Working Machine Co.
George B. Pettingill	T. H. Symington Co.
T. A. Soults	Sill Stove Works.
Louis P. Willsea	Willsea Works.

Entertainment Committee

H. G. Hetzler, chairman	Northwest Foundries, Inc.
David Baxter	Monroe Ave., Brighton Station.
A. N. Brayer	Co-operative Foundry Co.
C. E. Hoyt	Secretary American Foundrymen's Assn.
W. B. Robinson	Iron Age, Pittsburgh, Pa.
W. W. Sanderson	Carborundum Co., Niagara Falls, N. Y.
E. A. Scheibe	Bausch & Lomb Optical Co.
William J. Wark	E. J. Woodison & Co., Buffalo, N. Y.
Delos H. Wray	National Brass Mfg. Co.
V. L. Whitehead	Whitehead Bros., Buffalo.

Banquet Committee

W. R. Bean, president	American Foundrymen's Assn.
Alfred R. Howell, J. P. Pero, past presidents	American Foundrymen's Assn.
G. B. Pettingill	T. H. Symington Co.
Louis P. Willsea	Willsea Works.

Golf Committee

Matthew Elliott, chairman	Erie Foundry Co.
Donald S. Barrows	T. H. Symington Co.
William S. Riley	W. S. Riley Co.
J. F. Weller	Kellogg Mfg. Co.

Hotel Committee

A. H. Jones, chairman	American Woodworking Mach. Co.
A. R. McHenry	T. H. Symington Co.
A. J. Messner	Powers Hotel.

Publicity Committee

Edgar F. Edwards, chairman	Rochester Industrial Exposition Assn.
George Ely	American Woodworking Machine Co.
H. G. Stellwagen	North West Foundries, Inc.

Reception and Information Committee

Louis P. Willsea, chairman	Willsea Works.
Arthur Batzold	National Car Wheel Co.
Matthew Elliott	Erie Foundry Co.
J. W. Fulreader	James Cunningham, Son & Co.
James E. Gleason	Gleason Works.
G. W. Griswold	S. B. Roby Co.
Fratz Haverstick	Haverstick & Co.
David R. Henry	Flower City Foundry Co.
Charles P. Hery	Ingersoll, Erskine & Hesly.
A. C. Kehr	Foster-Armstrong Co.
V. C. Kreuter	American Laundry Machine Co.
Paul J. Lemke	Bausch & Lomb Optical Co.
James McHenry	Gleason Works.
S. E. Miller	Sargent & Greenleaf, Inc.
S. W. Miller	Rochester Welding Works.
Charles S. Owen	Chapin-Owen Co.
Theodore Pickering	Josiah Anstice & Co.
Robert L. Poole	General Railway Signal Co.
T. A. Soults	Sill Stove Works.
Mayor Clarence D. Van Zandt	City Hall.

Finance Committee

Schuyler H. Earl, chairman	Gleason Works.
Matthew Elliott	Erie Foundry Co.
Norman Van Voorhis	Galusha Stove Works.

ere the twenty-sixth annual meeting of the American Foundrymen's association will be held

Exhibits Will Reflect Progress

Equipment Shown at Rochester Will Represent Advance Made in Spite of Depression since Last Convention—List of Exhibitors Is Extensive—Many Machines Will Be Shown in Operation

FOR many years the exhibit of foundry equipment and supplies has been one of the principal features of the annual convention of the American Foundrymen's association. At Columbus in 1920 all previous records for space occupied by exhibits and the number of firms represented were broken and it was thought doubtful if facilities for housing the increasing expositions expected in the future could be found. However, the almost unprecedented depression which closely followed the 1920 meeting made it impracticable to carry out plans for a show in 1921. Early in 1922 when the spring meeting was being discussed, some doubt was expressed as to the response to be expected from manufacturers and foundry operators. That it was wise to proceed with the plans for a representative exhibit is proved by the manner in which manufacturers are participating in the foundry show. A glance at the list of exhibitors on page 1578 will reveal the fact that most of the firms represented in previous years at foundry shows will maintain exhibits at Rochester and that a number of concerns will exhibit at Rochester for the first time.

The exhibit will be held in three large buildings in Exposition park, which is a tract of about 45 acres within 10 minutes of the business section of Rochester. The three exhibition buildings are connected and also are adjacent to the auditorium where the technical sessions will be held. The names of the exhibitors together with a brief description of the exhibits and a list of their representatives are presented below.

What Exhibitors Will Display at Show

ABRASIVE INDUSTRY, Cleveland.—This booth will be fitted up as a rest room where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, D. M. Avey, H. E. Diller, Pat Dwyer, Charles Vickers, Charles J. Stark, Earl L. Shaner, Fred V. Cole, J. F. Ahrens, S. H. Jasper and Dann O. Taber.

ACHESON GRAPHITE CO., Niagara Falls, N. Y.—In this booth electrodes used in electric furnaces for metallurgical operations of all types will be shown, also various sizes of welding electrodes, foundry facing and cross sections of joints showing the details of machining necessary in making up electrodes for continuous feed. Representatives present will be as follows: Atwood B. Oatman, Fred E. O'Neil, Stanley L. Walworth and Lyman C. Judson.

AIR REDUCTION SALES CO., New York.—Automatic oxyacetylene welding and cutting machines for straight line and circle cutting of steel plates and forgings, equipment for cutting forgings, dies and shapes, hand holes and steam boiler headers, locomotive links and a tube welding machine will be exhibited. Hand welding and cutting torches for welding gray iron castings, steel and brass castings and for cutting cast-iron and steel, cylinders, and other accessories used in this industry also may be seen in this booth. Fred E. Rogers, H. Hazen, F. J. Leger and H. H. Melville will attend.

AJAX METAL CO., Philadelphia.—This exhibit will consist of a display of ingot metals, specimen castings and ball bearing alloys for babbitting. An electric furnace will be shown. Representatives are to be G. H. Clamer, W. J. Coane, Frank M. Willeson, Zeno D. Barns, C. F. Hopkins, Henry Giesecke, William Adams and Dudley Willcox.

ALLAN MFG. & WELDING CO., Buffalo.—

AMERICAN FOUNDRY EQUIPMENT CO., New York.—This company's exhibit will comprise sand cutting machines, sand blast, rotary-table room, gravity type, sand blast, tumbling barrel, cloth-screen type dust arrecter, screen hopper type sand blast tank, jolt roll-over squeeze pattern draw molding machine, hammer core machine, corrugated steel flask, aluminum taper snap flask, pattern mounts and centers. Those who will attend follow: Verne E. Minich, Elmer A. Rich Jr., Royer S. Buch, James Rigby Jr., Hutton H. Haley, John Donald Alexander, Charles G. Smith, Jerome E. Sweet, C. B. Schneible, C. D. Steinmeier, E. J. Turnbull, David Logan, R. H. Moore, Philip S. Weiner and R. H. Kelley.

AMERICAN WOODWORKING MACHINERY CO., Rochester, N. Y.—

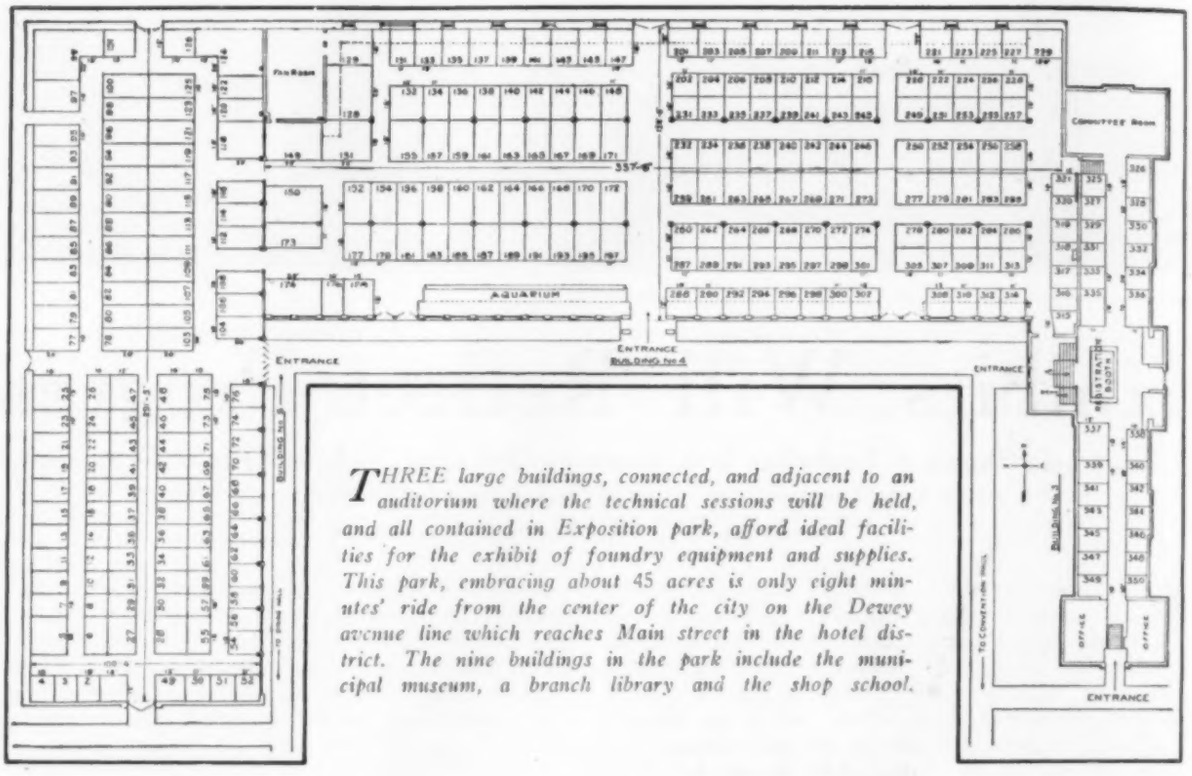
ARCADE MFG. CO., Freeport, Ill.—This exhibit will consist of hand and power machines in operation, a new type jolter with air-stripped, special piston ring squeezer, ordinary air squeezer, jolt squeezer and jolter. E. H. Morgan, Henry Tscherning, August Christen, R. E. Turnbull, L. L. Munn, Mentor Wheat and G. D. Wolfley will represent the company.

ASBURY GRAPHITE MILLS, Asbury, N. J.—This exhibit will comprise all grades of graphite and plumbago for foundry facing, lubricating and other purposes. Representatives will be H. M. Riddle, H. M. Riddle Jr., and I. D. Adams.

E. C. ATKINS & CO., Indianapolis.—Among the items in this display will be band saws, circular saws, machine knives, etc., for the pattern shop and woodworking foundry, also metal cutting saws for machine departments. The exhibit will be equipped with electric motors revolving the saws. Members of the organization present will be W. L. Sturtevant, B. D. Tompson, E. S. Norvell and T. A. Carroll.

AUSTIN CO., Cleveland.—This booth will be decorated with photographs and plans of

Where To Find Exhibitors at Foundry Show



THREE large buildings, connected, and adjacent to an auditorium where the technical sessions will be held, and all contained in Exposition park, afford ideal facilities for the exhibit of foundry equipment and supplies. This park, embracing about 45 acres is only eight minutes' ride from the center of the city on the Dewey avenue line which reaches Main street in the hotel district. The nine buildings in the park include the municipal museum, a branch library and the shop school.

No. of Booth	Exhibitor
232, 234, 259, 261	*Abrasive Industry*
265	Acheson Graphite Co.
91, 93, 95	Air Reduction Sales Co.
308, 310, 312, 314	Ajax Metal Co.
19	Allan Mfg. & Welding Co.
20, 22, 24, 26, 39, 41, 43, 45, 47	American Foundry Equipment Co.
195	American Woodworking Machinery Co.
103, 105, 107	Arcade Mfg. Co.
165	Armstrong-Blum Mfg. Co.
251	Asbury Graphite Mills
162, 164	E. C. Atkins & Co.
300	Austin Co.
68	B. & J. Mfg. Co.
290	Bacharach Industrial Instrument Co.
329, 331	Balbach Smelting & Refining Co.
132	Badger Tool Co.
160	C. O. Bartlett & Snow Co.
242	Basic Mineral Co.
50 and 51	Bastian-Blessing Co.
268, 270	Bausch & Lomb Optical Co.
97, 99, 100	Beardsley-Piper Co.
257	Beaudry & Co., Inc.
179, 181	Bethlehem Steel Co.
340	S. Birkenstein & Sons, Inc.
243	Black Diamond Saw & Machine Wks.
193	Blystone Mfg. Co.
244	Bonnot Co.
286	Brass World Publishing Co.
150	Carborundum Co.
271, 273	Frank D. Chase, Inc.
317	Chicago Crucible Co.
124, 126	Chicago Pneumatic Tool Co.
328	Chas. J. Clark Blastmeter Co.
28, 30	Clark Tructractor Co.
176, 178	Cleveland Crane & Engineering Co.
288	Cleveland Flux Co.
149	Cleveland Pneumatic Tool Co.
245	Clipper Belt Lacer Co.
227, 229	Thomas E. Coale Lumber Co.
206, 235	Cochrane-Bly Co.
254	F. A. Coleman Co.
295	Combined Supply & Equipment Co.
232, 234, 259, 261	*Daily Metal Trade*
10-12	Davenport Machine & Foundry Co.
6	Dayton Pneumatic Tool Co.
256, 258	Debevoise-Anderson Co.
14, 16, 35, 37	Wm. Demmler & Bros.
66	Detroit Electric Furnace Co.
158	Henry Disston & Sons
260, 262	Joseph Dixon Crucible Co.
214, 216	Dochler Die Casting Co.
77, 79	Electric Furnace Co.
294	Electro Refractories Corp.
74, 76	Federal Malleable Co.
232, 234, 259, 261	*The Foundry*
238	Foundry Equipment Co.
87, 89	General Electric Co.
34	Globe Iron-Crush & Shot Co.
57	Robert Gordon, Inc.
59, 61	Grimes Molding Machine Co.
155	Hanna Engineering Works
284	Clement Hardy Co.
191	R. G. Haskins Co.
152, 154	Hayward Co.
115, 117	Herman Pneumatic Machine Co.
131	High Speed Hammer Co.
281	Hill & Griffith Co.
109, 111	Hoevel Mfg. Corp.
298	Holcroft & Co.
189	Hyatt Roller Bearing Co.
137, 139	Independent Pneumatic Tool Co.
225	Industrial Controller Co.
128, 129	Ingersoll-Rand Co.
67, 69	International Molding Machine Co.
277, 279	*Iron Age*
232, 234, 259, 261	The Iron Trade Review
311, 313	Spencer Kellogg & Sons, Inc.
252	Kuehnle Co., Inc.
202	H. M. Lane Co.
237	Lava Crucible Co.
249	Leeds & Northrup Co.
173	Link Belt Co.
272, 274, 299, 301	David Lupton's Sons Co.
231, 233	J. S. McCormick Co.
264	*Machinery*
338	MacLean Publishing Co.
5	Macleod Co.
75	Malleable Iron Fittings Co.
225	Mechanical Appliance Co.
55	Menefee Foundry Co.
334	*Metal Industry*
302	Metal & Thermit Corp.
250	Michigan Smelting & Refining Co.
292	Mills, Rhines, Bellman & Nordhoff
64	Modern Pouring Device Co.
36	Moline Iron Works
78, 80, 82	Monarch Engineering & Mfg. Co.
114, 116	National Engineering Co.
42, 44, 46, 48	Wm. H. Nicholls Co., Inc.
266	Norma Co. of America
136	Northern Blower Co.
169, 171	S. Obermayer Co.
221	Ohio Body & Blower Co.
156	George Oldham & Sons Co.
118, 120, 122	Osborn Mfg. Co.

Where To Find Exhibitors at Foundry Show

(*Concluded from Page* 1578)

No. of Booth	Exhibitor
58, 60, 62	Oxweld Acetylene Co.
141, 143, 145, 147	Pangborn Corp.
267	J. W. Paxson Co.
232, 234, 259, 261	Penton Publishing Co.
282	Charles E. Pettinos
210	Geo. F. Pettinos
337	Pickands, Brown & Co.
287	Pittsburgh Electric Furnace Corp.
135	Porcelain Enamel & Mfg. Co.
40	Portage Silica Co.
84, 86	Henry E. Pridmore, Inc.
157, 159	Racine Tool & Machine Co.
283, 285	Richards-Wilcox Mfg. Co.
174	Rogers, Brown & Co.
108	P. H. & F. M. Roots Co.
54, 56	Royer Foundry & Machine Co.
208	Sabin Machine Co.
265	Safety Equipment Service Co.
151	Shepard Electric Crane & Hoist Co.
167	Simonds Mfg. Co.
7	Skinner Bros. Mfg. Co., Inc.
119, 121, 123, 125	W. W. Sly Mfg. Co.
278, 280, 305, 307	Werner G Smith Co.
11	Spencer Turbine Co.
1, 2, 3, 4	Sterling Wheelbarrow Co.
——	W. F. Stodder
83, 85	Sullivan Machinery Co.
81	Superarc Welding Machine Co.
140, 142, 144, 146, 148	Syracuse Supply Co.
27, 29, 31	Tabor Mfg. Co.
293	W. P. Taylor Co.
236	Taylor Instrument Companies
9	R. J. Teetor Co.
90, 92, 94, 96, 98, 100	Truscon Steel Co.
297	United Compound Co.
309	United States Graphite Co.
246	United States Silica Co.
49	Vibrating Machinery Co.
197	Wadsworth Core Machine & Equipment Co.
326	H. L. Wadsworth
177	J. D. Wallace & Co.
204	Wayne Oil Tank & Pump Co.
183, 185	Westinghouse Electric & Mfg. Co.
25	Westinghouse Traction Brake Co.
269	White & Bro., Inc.
71, 73	Whitehead Bros. Co.
166, 168, 170, 172	Whiting Corp.
201, 203, 205, 207, 209, 211, 213, 215	E. J. Woodison Co.
163	T. B. Wood's Sons Co.
104, 106	Young Bros. Co.

foundry construction. O. D. Conover, G. A. Bryant Jr., C. F. Chard, H. L. Cornelison and H. E. Stitt will be present.

B. & J. MFG. CO., Springfield, O.—A working demonstration of a flask guide will be supervised by George E. Jackson.

BACHARACH INDUSTRIAL INSTRUMENT CO., Pittsburgh.—An entirely new recording instrument especially designed for the foundry and which will give a graphic record of both pressure and volume of air delivered on the same chart, will be exhibited. Also indicating blast meter, new type pressure indicator, wall type recorder, carbon dioxide indicator, and manometer will be shown. L. L. Vayda will be in charge of the exhibit.

BADGER TOOL CO., Beloit, Wis.

BALBACH SMELTING & REFINING CO., New York.—Casting copper in ingots and ingot bars, yellow brass ingots, composition ingots, desilverized pig lead, antimonial pig lead, copper sulphate, copper shot, plumbers' lead, and gold and silver in bar form will be seen in this booth. F. Schumutzer, James MacNee, R. H. Thomas and Thomas Thomson will be present.

C. O. BARTLETT & SNOW CO., Cleveland.—Photographs and drawings of sand handling equipment for foundries, continuous molding and mechanical carrying equipment will comprise this display. Representatives are to be H. L. McKinnon, S. Gertz and Harry Orr.

BASIC MINERAL CO., Pittsburgh.—This company plans to exhibit minerals from their own mines. C. M. Miller and E. E. Miller will be present.

BASTIAN-BLESSING CO., Chicago.—Included in the contents of this booth will be welding and cutting apparatus, welding and cutting torches and safety regulators for welding and cutting.

BAUSCH & LOMB OPTICAL CO., Rochester, N. Y.—Metallurgical microscopes and metallographic apparatus will be found in this booth.

BEARDSLEY-PIPER CO., Chicago.—Tractor and turntable type, sand throwing molding machines will be demonstrated. E. O. Beardsley and E. L. Mitchell will be in charge.

BEAUDRY & CO., Boston.—A working model of power hammers arranged for motor drive will be in operation under the supervision of Archibald Parsons.

BETHLEHEM STEEL CO., Bethlehem, Pa.—Natural nickel-chrome-alloy pig iron will be shown together with a number of different types of castings made with this material added to the cupola mixture. These will include white iron for heavy wearing purposes, car wheels, oil engine castings, air compressor castings, gray iron castings, cylinder heads and pistons. Mining operation will be pictured. Robert MacDonald, H. P. Kreulen, D. A. Barkley, H. G. Walton and W. R. Shimer will represent the company.

S. BIRKENSTEIN & SONS, INC., Chicago.—This exhibit will consist of metals and castings, displayed by Louis Birkenstein, Harry Birkenstein, George Birkenstein, Frank McCaul, B. A. Shackelford, Louis Caviale, Eli Brown, Matt Schero and Charles B. Rapheal.

BLACK DIAMOND SAW & MACHINE WORKS, Natick, Mass.—Combined band saw filing and setting machines both belt and motor-driven, circular saw filing machine for wood and metal saws, band saw brazing outfit, band saw guide and flexible shafting will be exhibited. Representatives are to be Walter B. Ambler and P. P. Hubbard.

BLYSTONE MFG. CO., Cambridge Springs, Pa.—A sand mixer with screen and motor and power discharge will be on exhibition. E. F. Conroe and Ralph W. Barnes will represent the company.

BONNOT CO., Canton, O.—Informational data on powdered coal equipment and grinding machinery will be distributed by Stockton Harter, E. W. Steel and Charles Longenecker.

BRASS WORLD PUBLISHING CO., New York.—The booth occupied by this company will be fitted out as a rest room.

CARBORUNDUM CO., Niagara Falls, N. Y.—This company will show abrasive and refractory materials. Representatives present will be George S. Rogers, H. E. Kerwin, O. C. Dobson, S. F. Courter, J. A. King, C. E. Hawke and W. W. Sanderson.

FRANK D. CHASE, INC., Chicago.—Photographs and plans of buildings and foundries will be shown. Frank D. Chase, L. M. Hanson and Fred Graff will be the representatives.

CHICAGO CRUCIBLE CO., Chicago.—This company will exhibit graphite crucibles and other products.

CHICAGO PNEUMATIC TOOL CO., New York.—A 9 x 14 x 14-inch air compressor will be operated by this company. Chipping and riveting hammers of all sizes, air and electric drills, pneumatic and electric grinders, sand rammers for bench and floor work, pneumatic geared and cylinder hoists, air hose, hose couplings, and miscellaneous accessories will be shown in addition.

CHARLES J. CLARK BLASTMETER CO., Gladbrook, Iowa.—Volume and velocity meters and pressure gages will be shown by this company which will be represented by B. I. Harms.

CLARK TRUCTRACTOR CO., Buchanan, Mich.—In this company's booth will be exhibited a 72-inch wheel base tractor, lift-trucks, and hand hoists end dump body. A moving picture machine will show tractors at work. Representatives will be L. J. Schneider, J. W. Taylor, G. M. Chase and W. B. Eldred.

CLEVELAND CRANE & ENGINEERING CO., Wickliffe, O.—A tramrail train operated electrically with push button control, applicable for use in foundries in connection with the handling of molds from molding machines or from benches to the floor and also used in connection with pouring of molds in one-man systems, will be the principal feature of this exhibit. To illustrate the flexibility of the equipment, 100 feet of tramrail will be installed and suspended from this will be a carrier with an electro magnet. Information will be distributed on the large type cranes. Representatives will include L. E. Falon, F. J. Brittingham, A. F. Anjenkey, D. T. Laylin, H. G. Webb, W. C. Heinle, William G. Wehr, E. T. Bennington, C. C. Robbins and J. B. Shaver.

CLEVELAND FLUX CO., Cleveland.—A complete line of fluxes including a brass casting cleaner will be displayed under the auspices of Clifford B. Cornell, Loren E. Souers, David B. Baxter, James A. Rice and Elizabeth C. Weisblat.

CLEVELAND PNEUMATIC TOOL CO., Cleveland.—Riveting hammers, air drills, compound and plain geared and breast and rotary types, sand rammers, for flask, bench and floor work, portable grinders, core breakers, chipping hammers, air valves, jarring machines and pipe bending machines will be shown. Representatives are to be H. S. Covey, A. Scott, J. T. Graves, C. D. Garner and G. Gregory.

CLIPPER BELT LACER CO., Grand Rapids, Mich.—Belt lacers, belt hooks, rawhide pins and various types of laced belts will be shown by this company. Carl P. Field will be in charge.

THOMAS E. COALE LUMBER CO., Philadelphia.—Pattern lumber including Michigan soft cork white pine and California sugar pine are to be exhibited.

COCHRANE-BLY CO., Rochester, N. Y.—A metal sawing machine, an automatic saw

sharpening machine, vertical millers and shapers and filing machine will be shown in charge of W. H. Welch.

F. A. COLEMAN, Cleveland.—A booth will be equipped by this company for use as a rest room with F. A. Coleman present to meet visitors.

COMBINED SUPPLY & EQUIPMENT CO., INC., Buffalo, N. Y.—This exhibit will be devoted mainly to double and angle stem chaplets. Those in charge will be S. De Vinness Jr., and C. L. Jackson.

DAILY METAL TRADE, Cleveland.—This booth will be fitted up as a rest room where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, D. M. Avey, H. E. Diller, Pat Dwyer, Charles Vickers, C. J. Stark, E. L. Shaner, Dann O. Taber, Fred V. Cole, J. F. Ahrens and S. H. Jasper.

DAVENPORT MACHINE & FOUNDRY CO., Davenport, Iowa.—Jolt roll-over pattern draw machines and jolt stripper machines will be included in this exhibit. Carl Falk, A. V. Magnuson, J. T. Anderson, A. D. Ziebarth will be the representatives present.

DAYTON PNEUMATIC TOOL CO., Dayton, O.

DEBEVOISE ANDERSON CO., New York.—Included in the equipment of this booth will be samples of pig iron, coal and coke under the auspices of Mills Anderson, W. K. Callow and A. E. Kelly.

WM. DEMMLER & BROS., Kewanee, Ill.—An air-operated core machine will be demonstrated by H. L. Demmler and F. A. Demmler.

DETROIT ELECTRIC FURNACE CO., Detroit.—Materials manufactured in electric furnaces together with literature, photographs and general information will be installed in this booth. A continuous operation of a 1-ton electric furnace will be a feature. Those in attendance will be E. L. Crosby, E. T. Gushee, H. M. St. John and A. E. Rhoads.

HENRY DISSTON & SONS, INC., Philadelphia.—This company will equip their booth with milling, hack and metal band saws, blades, files and tools. Joseph L. Dorrington and L. M. Willard are to attend.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.—This exhibit will contain graphite products in charge of R. F. Leonard and R. R. Belleville, C. A. Shaw and R. H. Brinkerhoff.

DOEHLER DIE-CASTING CO., Brooklyn, N. Y.—Die casting aluminum, zinc, tin and lead alloys, finished brass castings, together with assemblies showing applications of the product, will make up this exhibit. Die-cast ice skates, mechanical rubber molds for balls, parts for wireless apparatus, radiophone sets and die-cast scissors, will be included in the finished products shown. Representatives include H. H. Doehler, Charles Pack, C. E. Hart and E. R. Zabriskie.

ELECTRIC FURNACE CO., Salem, O.—A model furnace will be shown.

ELECTRO REFRACTORIES CORP., Buffalo, N. Y.

FEDERAL MALLEABLE CO., West Allis, Wis.—This will be a working exhibit of squeeze stripper and other types of molding machines, in charge of L. C. Wilson, K. H. Siemens and W. J. MacNeil.

THE FOUNDRY, Cleveland—This booth will be fitted up as a rest room where all will be invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, D. M. Avey, H. E. Diller, Pat Dwyer, Charles Vickers, C. J. Stark, E. L. Shaner, Dann O. Taber, F. V. Cole, J. F. Ahrens and S. H. Jasper.

FOUNDRY EQUIPMENT CO., Cleveland.—Photographs of actual installations of core and mold ovens and brass and aluminum melting furnaces will be displayed. Car-type, portable rack-type, and rolling drawer ovens also will make up the exhibit. C. A. Barnett, R. W. Bronson, M. A. Beltaire Jr., and S. D. Rickard will represent the company.

GENERAL ELECTRIC CO., Schenectady, N. Y.—A 50-pound crucible melting furnace with automatic control panel and transformer and portable semiautomatic arcwelding equipment operated by a 200-ampere portable motor-generator set with necessary starting and control panel will be demonstrated.

GLOBE IRON-CRUSH & SHOT CO., Mansfield, O.—High carbon chilled shot for sand blasting purposes will make up this booth. Those in charge will be E. O. Townsend and L. A. Cline.

ROBERT GORDON, INC., Chicago.—This exhibit will consist of a ¼-size working model of a mechanical hot blast heater showing the operation of this unit for foundry heating and photographs of installations. Those in charge will be T. H. Monaghan, A. L. Weixel, J. L. Zimmerman and R. M. Zimmerman.

GRIMES MOLDING MACHINE CO., Detroit.—This company expects to exhibit a hand rammed rollover molding machine and a 2500-pound capacity jar ram rollover molding machine. George L. Grimes and Charles J. Skeffington will be the representatives.

HANNA ENGINEERING WORKS, Chicago.—A cross section of the pneumatic cylinder hoist showing piston and piston rod features, also a cross sectional photograph of an air jolt machine, I-beam trolleys and vibrators will be displayed. Representatives present will include A. F. Jensen, J. C. Hanna, O. F. Weiss and J. O. Clark.

CLEMENT HARDY CO., Chicago.—Photographs of plants constructed by this company, including foundries for the Defiance Machine Works and the Hercules Gas Engine Co., will be shown.

R. G. HASKINS CO., Chicago.—Flexible shaft equipment and portable tools will be exhibited by the company's representative, R. G. Haskins.

HAYWARD CO., New York.—An exhibit will be made of working models of clamshell and orangepeel buckets and an electric motor bucket of this type also will be shown in operation. In addition to the foregoing equipment, a collection of photographs illustrating this company's machines in operation in foundries and other industries will be displayed.

HERMAN PNEUMATIC MACHINE CO., Pittsburgh.—A small working model of independent rollover and pattern drawing machine are to be exhibited. Robrt F. Ringle, I. J. Oesterling, R. P. Morgan, Robert Porteous, C. W. Miller, C. S. McMath, W. W. Hughes, Thomas Kaveny, A. G. Doyle and R. Harris will represent the company.

HIGH SPEED HAMMER CO., Rochester, N. Y.—In addition to exhibiting different sizes of high speed riveting hammers, this company will give actual demonstrations. H. A. Moore will be in charge.

HILL & GRIFFITH CO., Cincinnati.—This booth will be fitted up as a rest room with John Hill, William Oberhelman, Bruce Hill and C. L. Gisin present to receive visitors.

HOEVEL MFG. CORP., Jersey City, N. J.—This display will consist of dustless, self-contained, automatic, sand-blast machines comprising an 88-inch table machine, 32 x 40 barrel machine in operation, sand-blast tank, injector and injector sand blast. J. M. Betton, L. V. Patmore and F. Welte will be in charge.

HOLCROFT & CO., Detroit.—Photographs, drawings and technical data on metallurgical furnaces with special attention to electrical furnaces will comprise this exhibit, which will be in charge of Charles T. Holcroft and H. L. Ritts.

HYATT ROLLER BEARING CO., New York.—A complete line of bearings for cranes, trolleys, hoists, trucks, conveyors, sand mixing machinery, machine tools, cars, power transmission lines and other foundry equipment are to be shown. An electrically operated model demonstrating a bearing enclosed in glass will supply a visual demonstration of a positive oiling action. Representatives will include D. Gleisen, W. B. Wachtler, John F. McGuinness and F. H. Knight.

INDEPENDENT PNEUMATIC TOOL CO., Chicago.—Developments and inventions in machine tool equipment for foundry purposes will be shown; representatives present will include R. T. Scott, H. G. Keller, F. H. Charbono, F. J. Passino, S. W. Lanham, H. F. White and A. Anderson.

INDUSTRIAL CONTROLLER CO., Milwaukee.—Manually operated and automatic alternating current compensators and automatic, across-the-line type, alternating-current starters will be demonstrated. The automatic apparatus will be equipped with remote control push buttons and time element control stations. Compensators and starters are equipped with low voltage and overload protective devices. J. H. Burroughs and R. G. Kellogg will be in attendance.

INGERSOLL-RAND CO., New York.—This company will show a 2-stage 11 x 7 x 10-inch stroke air compressor with short belt drive, a 100-pound pressure machine with 300-foot cubic capacity, also pneumatic tools including sand rammers, portable pneumatic grinder, air driven wire brushes for cleaning castings, shipping hammers, air motor hoist, air drills and riveting hammers.

INTERNATIONAL MOLDING MACHINE CO., Chicago.—Combination power, turnover machines, combination jolt-stripping machines, hand turnover and special machines for core work will be installed. Edward A. Pridmore, S. W. Hamel and E. G. Borgnis will be in charge.

IRON AGE, New York.—

IRON TRADE REVIEW, THE, Cleveland.—This booth will be fitted as a rest room where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, D. M. Avey, H. E. Diller, Pat Dwyer, Charles Vickers, C. J. Stark, E. L. Shaner, Dann O. Taber, Fred V. Cole, J. F. Ahrens and S. H. Jasper.

SPENCER KELLOGG & SONS, INC., Buffalo, N. Y.—Samples of core oils and cores will be shown. This exhibit will be in charge of W. L. Goetz, J. N. Yaeger, Enos G. Allen, George B. Chase and M. B. Nordlie.

KUEHNLE CO., INC., Philadelphia.—Cores and oils in different grades, trade marks and advertising material will be shown. Albert C. Kuehnle, James A. Burk and E. M. Satterthwaite will be in charge.

H. M. LANE CO., Detroit.—The booth of this company will be fitted up with photographs and drawings of industrial plants. H. M. Lane, A. O. Thomas and G. Pitt will be in charge.

LAVA CRUCIBLE CO., Pittsburgh.—This exhibit will consist of samples of crucibles, furnace cement and metal flux. Representatives will be Paul L. Berkey, Furman South Jr., D. E. MacLean and A. J. Gloekler.

LEEDS & NORTHRUP CO., Philadelphia.—The display of this company will include potentiometers, pyrometers, of both indicating and recording types including the two-couple hot and cold zone temperature recorder which is suited particularly to the control of temperatures in malleable iron annealing ovens. O. Brewer and E. B. Estabrook will be present.

LINK-BELT CO., Chicago.—This exhibit will consist of a revivifier and an electric hoist under the auspices of A. G. J. Rapp.

DAVID LUPTON'S SONS CO., Philadelphia.—Pivoted, counter balanced and continuous sash operating devices and steel factory sash

ment are among the items to be displayed. A model of a foundry building with patented truss roof design will be a feature. Those who will represent the company include Clarke P. Pond, Charles F. P. Buckwalter, J. H. Throm, C. N. Hingston and C. A. Bockius.

J. S. McCORMICK Co., Pittsburgh.—This exhibit will include some new equipment in addition to foundry facings supplies, etc. Representatives will be J. S. McCormick, T. E. Malone, S. R. Costley, E. M. Lewis and George Somerhalder.

MACHINERY, New York.—

MACLEAN PUBLISHING CO., Toronto, Ont.—This booth will be fitted up as a rest room; representatives, B. G. Newton, G. M. Smith, W. L. Gifford, A. H. Byrne and S. S. Moore.

MACLEOD CO., Cincinnati.—Sand blast tumbling barrels, sand blast hose machine, a model of dust arresters and oil burning equipment will be displayed. James Lauder and Alfred Anderson will be in charge.

MALLEABLE IRON FITTINGS CO., Branford, Conn.—A working exhibition of a vibrator riddle will be shown together with a line of accessories. G. B. Pickop will have charge.

MECHANICAL APPLIANCE CO., Milwaukee.—Included in this exhibit will be a 1½-horsepower, 3600 revolution per minute motor, a ½ horsepower 1200 revolutions per minute, and a 10-horsepower, 1800 revolutions per minute, ball bearing motors of interest to foundry operators and also motors connected to machines of other exhibitors. W. B. Crabtree will be the representative.

MENEFEE FOUNDRY CO., Fort Wayne, Ind.—This company will show and demonstrate a pattern compound and patterns made from it.

METAL INDUSTRY, New York.—The booth occupied by this company will be fitted out as a rest room.

METAL AND THERMIT CORP., New York.—Transparencies and photos showing various applications of thermit for welding and demonstrations of the use of thermit for pipes, will be displayed. Arthur A. Braid and J. W. Wilson will attend.

MICHIGAN SMELTING & REFINING CO., Detroit.—Noncorrosive bronze high tensile strength which can either be forged, cast or extruded will be exhibited. Brass and bronze ingots together with castings made from each grade, also babbitt, solders and white metal die castings will be seen at the booth; representatives, John R. Searles, Norman Sillman, Henry Levitt, B. P. Cooke, C. L. Hall, J. P. Tiernan and R. R. Arnold.

MILLS, RHINES, BELLMAN & NORDHOFF, Toledo, O.—This exhibit will be constituted mainly of blue prints of foundries, forge shops and machine shops, photographs showing completed buildings together with illustrations of plants and types of buildings. Estimating data will be distributed. Representatives follow: George S. Mills, George V. Rhines, John Gillett and Morris Hobbs.

MODERN POURING DEVICE CO., Pt. Washington, Wis.

MOLINE IRON WORKS, Moline, Ill.—Squeezer molding machines will comprise this company's exhibit. B. V. Nutt will be in charge.

MONARCH ENGINEERING & MFG. CO., Baltimore, Md.—This company will exhibit special tilting crucible furnaces, foundry cupolas, sand mixers, core ovens, soft metal furnaces, oil pumps, pressure blowers, hardening and annealing furnaces, ladle heaters, etc. The representatives will be Frank Maujean, James V. Martin, Lees Hall, William Raber, I. D. Adams and H. D. Harvey.

NATIONAL ENGINEERING CO., Chicago.—Three different sizes of sand mixer will be in operation. Those representing the company will be H. S. Simpson, S. A. Cleland, C. J. Skeffington and Barney Castor.

WM. H. NICHOLLS CO., INC., Brooklyn, N. Y.—This exhibit will consist of a new portable machine, a combined jolt and power squeezer with drawing devices, jolt squeezer with magnetic drawing device, combined jolt and power squeezers with stripping drawing device and a combined jolt and power squeezer with stripping device.

NORMA CO. OF AMERICA, Long Island City, N. Y.—Displays of precision ball bearings, roller journal bearings and ball thrust bearings will occupy the booth of this company. F. W. Mesinger and R. E. Hecker will be present.

NORTHERN BLOWER CO., Cleveland.—This company will display two types of dust arresters, a sand blast room, blow pipes and blowers in charge of M. E. Eiben and E. J. Moore.

S. OBERMAYER CO., Chicago.—Cements both dry and plastic with photographs and demonstration of partings will comprise this company's exhibit. H. D. Barker, J. E. Evans, W. C. Samuals, J. L. Cummings, A. J. Beckman, William Lawson, E. D. Frohman, S. T. Johnson and Theodore Hoffman will represent the company.

OHIO BODY & BLOWER CO., Cleveland.—Demonstrations will be made of portable type core ovens, rack type core ovens, aircrafts and separators. C. F. Mayer and W. E. Clement will represent the company.

GEORGE OLDHAM & SON CO., Baltimore.—This company will have in operation pneumatic equipment as chipping hammers, foundry rammers, scalers and riveting hammers; representatives, H. J. Bannister, R. W. Nelson, J. T. Biles and P. Woolfolk.

OLIVER MACHINERY CO., Grand Rapids, Mich.—

OSBORN MFG. CO., Cleveland.—Rollover jolt machine, electrically operated with pattern draw, electrically-operated, flask filling machine, jolt squeezers, plain air squeezers, hand operated rollover machine and hand operated stripper machine will be displayed. Representatives include Franklin G. Smith, H. R. Atwater, E. S. Carman, E. T. Doddridge, J. C. Alberts, R. E. Kiefer, F. T. Spikerman, H. E. Deakins and M. R. Atwater.

OXWELD ACETYLENE CO., Newark, N. J.—Welding and cutting apparatus, acetylene generators, supplies, educational features, demonstrations of welding and cutting, incidental to foundry needs and cutting iron may be seen at this booth.

PANGBORN CORP., Hagerstown, Md.—Sandblast equipment, both stationary and in operation, including barrel sand blast, cabinet sand blast, cabinet table sand blast, sand blast room, hose machine portable sand blast and a new model dust arrester will be shown. Those in charge will be Thomas W. Pangborn, John C. Pangborn, P. J. Potter, F. J. Hull, George A. Cooley, Jesse J. Bowen, Roy C. Koch, Charles T. Bird, W. C. Lytl and H. D. Gates.

J. W. PAXSON CO., Philadelphia.—Showing foundry supplies and molding sands, this company will be represented by H. M. Bougher, J. F. Gaehring, C. B. Somers and I. F. Kremer.

PENTON PUBLISHING CO., Cleveland.—This booth will be fitted up as a rest room where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, D. M. Avey, H. E. Diller, Pat Dwyer, Charles Vickers, C. J. Stark, E. L. Shaner, Dann O. Taber, Fred V. Cole, J. F. Ahrens and S. H. Jasper.

CHARLES PETTINOS, New York.—A complete line of molding sand, foundry plumbago blacking and various grades of graphite are to be on exhibition. Charles Pettinos, M. M. Houskeeper, Marshall M. Houskeeper and J. Howard Bing are to be present.

GEO. F. PETTINOS, Philadelphia.—Molding sand, foundry facings and blackings, other graphite products and foundry supplies will be shown. George F. Pettinos, H. B. Taylor, James H. Hatten and H. I. Graves will attend.

PICKANDS, BROWN & CO., Chicago—Will display samples of coke and iron.

PITTSBURGH ELECTRIC FURNACE CORP., Pittsburgh.—This exhibit will consist of photographs and pictures of electric furnaces and castings which have been produced.

PORCELAIN ENAMEL & MFG. CO., Baltimore.—Miniature porcelain enameling equipment will be enameling cast iron at this exhibit.

PORTAGE SILICA CO., Youngstown, O.—Conglomerate rock in its natural state and samples of finished sand-blast sand, steel molding and core sands will be shown. E. E. Kloos, L. R. Farrell and C. F. Eberhart will be in charge.

HENRY E. PRIDMORE, INC., Chicago.—Included in this exhibit will be a 10-inch draw combination, electric-jolt, power-rockover drop machine with mounted patterns, a 16 x 20-inch to 8-inch draw combination electric jolt strip machine with mounted pattern, a 2 to 10 x 12-inch square sand machine with mounted brakeshoe patterns and a 14 x 16-inch to 5-inch drop rockover drop machine with patterns. Representatives will be Mrs. Henry E. Pridmore, Henry A. Pridmore, Marshall E. Pridmore, D. F. Eagan, C. H. Ellis and Henry G. Schichter.

RACINE TOOL & MACHINE CO., Racine, Wis.—High speed metal cutting machines, broach slotters and keyseaters will make up the contents of the booth.

RICHARDS-WILCOX MFG. CO., Aurora, Ill.—This exhibit will include overhead conveying tracks of both trolley and I-beam types, switches, cross overs, ball bearing trolleys, ball bearing traveling cranes and chain blocks. A. J. Eggleston, E. J. G. Phillips, H. R. Butler, W. W. O'Brien and R. F. Murphy will be the representatives present.

ROGERS, BROWN & CO., Cincinnati.—An electrically operated map showing the location of blast furnaces, coke ovens, iron ore and fluor spar mines as well as the location of other points to which the company ships various commodities, will be seen at this booth. Those who will attend are R. W. Clark, George R. Sullivan, H. W. Fernald, Thomas A. Wilson, Harwood Wilson, A. F. Stengel, W. R. Maher, F. W. Bauer and J. R. Morehead.

P. H. & F. M. ROOTS CO., Connersville, Ind.—The list of equipment to be exhibited includes a foundry type blower for operation in connection with foundry cupolas, a charging hoist, flask guides and wind gates. Representatives follow: H. M. Papworth, W. H. Morgan, D. R. Schively, E. A. Overhiser, H. Snyder and Paul Diver.

SABIN MACHINE CO., Cleveland.—One man trucks and steel factory barrels, both straight and tapered, will be seen at this booth. H. B. Sabin, O. T. Sabin and A. A. Dorod will represent the company.

SAFETY EQUIPMENT SERVICE CO., Cleveland.—Safety devices including goggles, sand blast helmets, fireproof and asbestos gloves, leggings, welding helmets, safety danger signs and first aid equipment will be shown. C. W. Nutt and H. L. Woods will represent the company.

SHEPARD ELECTRIC CRANE & HOIST CO., Montour Falls, N. Y.—This exhibit will consist of small cranes, electric hoists mounted on I-beams, including a demonstration of the ease with which roller bearing trolleys push along the runway. In charge of the demonstration will be R. H. McGredy, F. A. Hatch, G. L. Drake, J. E. La Tourrette and H. H. Hickman.

SIMONDS MFG. CO., Fitchburg, Mass.—

In this booth will be seen metal saws, hack saw blades and files and an inserted-tooth, metal cutting-off saw will be shown machine cutting steel bars; representatives, H. B. McDonald and H. A. Schulte.

SKINNER BROS. MFG. CO., INC., St. Louis.—A motor-driven, 4 x 4-foot heater for heating foundries and industrial plants will be shown in operation. This apparatus exhausts cold air from the foundry floor in cold weather and forces it up through a set of pipe coils and out through a directing elbow outlet. E. V. D. Wallace will be in attendance.

W. W. SLY MFG. CO., Cleveland.—A complete sand blast room installation including pressure tank, sand elevator and dust arrester will be constructed so that an observer can see the process through glass illustrating the elevation of sand, its preparation, catching the dust and returning the abrasives to the tank. A tilted sand blast mill, a sand blast cabinet, horizontal sand blast mill and a steel core oven, a table of model tumbling mills will also be displayed. Representatives will be S. C. Vessy, F. W. Klatt, F. A. Ebeling, D. L. Harris, C. P. Guion, D. P. Carter, J. L. Battenfeld, J. W. Dopp, H. J. Felsburg, J. D. Turner, M. A. Schnaedelbach and R. W. Hasselle.

WERNER G. SMITH CO., Cleveland.—Samples of core oils and specimens of cores made from oils manufactured by this company will be on exhibition. The following men will be present: Werner G. Smith, Milton S. Finley, Frank H. Grace, Frank H. Dodge, L. P. Robinson, William E. Rayel, E. H. Hartlein, Louis F. Ferster.

SPENCER TURBINE CO., Hartford, Conn.—This company will show turbo compressors, featuring equipment for use with cupolas and also for oil burning brass melting furnaces. Those expected to be present will be H. M. Grossman, Willard G. Cross and S. E. Phillips.

STERLING WHEELBARROW CO., West Allis, Wis.—A complete line of wheelbarrows and flasks with a testing machine in operation, a wheelbarrow loaded with 650 pounds mounted over a 42-inch pulley running at 32 revolutions per minute, will be demonstrated.

W. F. STODDER, Syracuse, N. Y.—Suction sandblast apparatus, oil burners and sandblast cleaning tables will be shown.

SULLIVAN MACHINERY CO., Chicago.—This company will exhibit short belt connected air compressors, single stage belt driven air compressors, compressed air forge hammer in operation and core breakers. Representatives will be Chester D. Cummings, Alden L. Covill and Alexander Milne.

SUPERARC WELDING MACHINE CO., Detroit.—

SYRACUSE SUPPLY CO., N. Y.—Machine tools including machines, sensitive drill press and smaller equipment used in machine shops, will occupy this booth.

TABOR MFG. CO., Philadelphia.—A complete line of molding machines, including squeezers, jar squeezers, jar strippers, pattern machines and jar rollovers can be seen at this booth. The representatives are to be Wilfred Lewis, H. W. Brown, J. T. Ramsden, H. W. Impey, John Fendner, E. S. Lewis, W. E. Sewell, J. H. Coleman, T. L. Sumner and P. J. Shire.

W. P. TAYLOR CO., Buffalo.—Small, high-grade electric steel castings of various types will comprise this display. The company will be represented by C. D. Taylor, James W. Gibney and W. J. Gibney.

TAYLOR INSTRUMENT COMPANIES, Rochester, N. Y.—A complete line of electrical pyrometers for foundry work, also recording and indicating thermometers for core ovens will be shown. H. B. Brown, G. A. Howell, A. A. Sandy, J. J. Kimmel, C. B. Carbon and J. W. Schwarz will be representatives present.

R. J. TEETOR CO., Cadillac, Mich.—Suspended type molding machines in operation will be seen at the booth of this company which will be in charge of C. W. Eyke.

TRUSCON STEEL CO., Youngstown, O.—The exhibit will consist of pressed steel foundry flasks; a pressed steel platform for lift trucks; photographs and layouts of various types of industrial buildings, and side wall steel windows, top hinge continuous monitor steel sash and a tension operating device.

UNITED COMPOUND CO., Buffalo, N. Y.—Vent and pattern wax and corrugated gaggers will comprise this exhibit in charge of W. F. Bradley and L. F. Leney.

UNITED STATES GRAPHITE CO., Saginaw, Mich.—Included in the exhibit of this company will be various grades of plumbago and foundry facing manufactured from pure natural graphite. Other graphite products such as air floated graphite, greases, and carbon brushes will be shown. Those in charge will be G. D. Robinson, R. J. Edminston and C. D. Mackintosh.

UNITED STATES SILICA CO., Chicago.—Samples of shot for sand blasting and silica for steel molding, samples of castings will be exhibited. Volney Foster, Lewis B. Reed, H. F. Goebig and T. S. Rogers will be in charge.

VIBRATING MACHINERY CO., Chicago.—Riddles with automatic discharge of tailings will be exhibited in this booth. Julius Schroeter, Arthur Piepjohn and William Lindsay will represent the company.

WADSWORTH CORE MACHINE & EQUIPMENT CO., Akron, O.—A coremaking machine and core cutting off coning machine and various sizes of all steel floor plates and bottom plates are to be exhibited.

WADSWORTH SAND CUTTER, Cleveland.—Motion pictures of operating machinery will be shown under the supervision of H. L. Wadsworth, H. B. Fay and K. F. Barrow.

J. D. WALLACE & CO., Chicago.—Portable bench tools for use in the pattern shops and foundries will be shown. Among the improved equipment will be a 16-inch band saw of the splash lubrication type which oils the bearings by centrifugal force, the gears running in oil. An automatically controlled glue pot which maintains the temperature of the glue constant at 150 degrees and is equipped with a thermostat which automatically cuts off the current when the proper tempertature has been attained and when the temperature has droppd 5 degrees, the connection is made to increase the heat, is to be displayed. Those in attendance will be J. D. Wallace, C. J. Rennie, A. N. Frecker, William Uhlhorn, C. E. Ward, A. M. Andresen and F. W. Andresen.

WAYNE OIL TANK & PUMP CO., Fort Wayne, Ind.—This exhibit will comprise a stationary, pit-type crucible melting furnace with air pre-heater, a ladle heater, portable wheel tank for core oil, automatic interlocking fuel cutoff valve and high and low pressure oil and gas burners. R. P. Maynard will be in charge.

WESTINGHOUSE ELECTRIC & MFG. CO., Pittsburgh.—The booth to be occupied by this company will be fitted out with industrial products including machine shop equipment and supplies, among which will be an 175-ampere portable arc-welding set in operation, industrial automatic controllers of alternating and direct current type demonstrating the interchangeability of parts. Industrial motors in operation also will be a part of the exhibit. W. W. Reddi, A. M. Candy, Paul Orr, F. D. Egan and A. M. Turner will represent the company.

WESTINGHOUSE TRACTION BRAKE CO., Pittsburgh.—The principal items to be shown are a 335-cubic foot piston displacement, motor-driven air compressor driven from a 60-horsepower, 3-phase, 60-cycle, 220-volt alternating current motor through herringbone gear and pinion including automatic water control valve mounted on a common bed plate. A main reservoir enameled inside and out designed for a working pressure of 140 pounds per square inch including drain cock single pointer air gage and safety valve also will be exhibited. Those in attendance will be M. H. Burchard, O. H. Miller, J. F. Ames, S. A. King and F. C. Young.

WHITE & BRO., INC., Philadelphia.—Metals, comprising composition and yellow ingot brass, manganese bronze, casting copper and white metals will be shown. G. Horace Krider, L. D. Kluver, Raymond Hunter, Harold Reinhardt, C. B. White and Frank Krug will attend.

WHITEHEAD BROS. CO., Buffalo, N. Y.—The booth belonging to this company will be fitted up as a reception room. A few samples of molding sand will be shown. The following representatives are expected to attend: A. J. Miller, B. L. Whitehead Jr., J. H. Whitehead, R. L. Cleland, A. W. Jacus, A. Y. Gregory and R. L. Carpenter.

WHITING CORP., Harvey, Ill.—In this booth will be a sand cutting and screening machine, crane ladle with helical worm gearing, a set of helical worm gearing with a section cut away, tumbling barrel parts, vertical air hoist, model of crane trolley and photographs and drawings of equipment. The Grindle Fuel Equipment Co., a subsidiary of tne former company, will exhibit in this same booth. J. H. Whiting, T. S. Hammond, R. H. Bourne, R. E. Prussing, J. S. Townsend, G. P. Fisher, A. W. Gregg, C. H. Erickson, W. A. Goebel and A. J. Grindle will be present.

E. J. WOODISON CO., Detroit.—Core and molding machines, foundry supplies, platers and polisher supplies will be included in this display. Representatives will be E. J. Woodison, C. H. Woodison, J. C. Woodison, G. A. Burman, A. W. Ferguson, A. F. Jordan, H. Z. Dingee, R. S. Hoffman, M. A. Bell, J. M. Whitters, William Wark, E. A. Mead, J. A. Carpenter, F. F. Shortsleeves, C. D. Pinkerton, R. Higgins, George H. Quinn, William Muir, W. W. Wright, R. A. Burritt, George H. Donaghue, H. T. Taylor, W. W. Bowring, E. C. Schafer and W. M. Maybank.

T. B. WOOD'S SONS CO., Chambersburg, Pa.—Taper snap molding, comprising the taper snap flask and automatic adjustable patented snap jacket will be included in this display. Charles M. Wood and Victor Leisher will represent the company.

YOUNG BROTHERS CO., Detroit.—An insulated steel panel oven designed for heating with gas, oil or coke, also a small testing or laboratory oven, electrically heated, and oven accessories will be exhibited; samples of cores baked in these ovens will be shown under the auspices of G. A. Young, R. B. Reed, T. P. McVicker, V. A. Fox, J. E. Randall and E. F. Oates.

ANFENGER JACOBSON ADVERTISING CO., St. Louis.—This company will have on exhibit of heaters of medium capacity and a direct fire heater used in foundries. E. V. D. Wallace will be in charge.

ARMSTRONG-BLUM MFG. CO., Chicago.—An operating exhibit will be conducted of an automatic speed saw and a metal band saw. A new model hack saw equipped with individual motor as a portable outfit supplied with current taken from an ordinary lamp socket and a punch shear and bender, also will be demonstrated; representatives, Harry J. Blum and George J. Blum.

BOYER FOUNDRY & MACHINE CO., Wilkes-Barre, Pa.—Working models of sand airifying separator and blender combined in one machine together with a smaller model built with blast hoppers to show the new principle of combing sand in separate grains, separating the foreign material from and discharging from the machine in a manner which airifies each particle of the sand, is to be exhibited.

Firmer Tone in Welsh Tin Plate Trade

(*Concluded from Page* 1541)

sumers' hands are being absorbed, with the result that there is a continuance of buying. This applies particularly to the export market. Prices may go higher in the near future. An increasing business has been done from stocks at 19 shillings 9 pence ($4.35) basis I. C., f.o.b. Option contracts for April and May have been done in considerable numbers at 19 shillings 6 pence ($4.30) basis I. C. f.o.b. Prompt rates are 19 shillings 9 pence ($4.35 to $4.42) basis I. C. f.o.b., and forward plates 19 shillings 6 pence to 19 shillings 9 pence ($4.30 to $4.35) basis I. C. f.o.b. The Argentine, South America, Holland and Portugal have bought plates, and there has been some demand from the Far East and Germany, while Italy, Scandinavia and Canada are in the Market.

In the home trade, odd sizes have been purchased at 19 shillings 6 pence ($4.30) f.o.b. Ternes are steady at 18 shillings ($3.97) basis I. C. f.o.b.

Tin plate quotations are: Cokes, 20 x 14 inches, 19 shillings 6 pence to £1 ($4.30 to $4.42); quarters, £1 10s 3d ($6.62); cokes, 20 x 10 inches, £1 8s 3d to £1 8s 9d ($6.25 to $6.30); cokes, 28 x 20 inches £1 15s to £1 16s 6d ($7.72 to $7.93).

Tin bars remain at £ 7 7s 6d ($32.50) per ton, delivered. As raw materials are advancing it is more than likely the official minimum will be raised.

No substantial business is moving in galvanized sheets. Prices are steady, works holding for £16 to £16 5s ($70.60 to $71.70) f.o.b., for 24 gage corrugated in bundles, delivery in May. China is showing an interest in thin gages.

Business has increased slightly in the scrap market. Prices are: Heavy melting steel scrap in furnace sizes, £3 5s to £3 10s ($14.30 to $15.40) heavy steel turnings £2 13s 6d to £2 18s ($11.70 to $12.80); bundled steel scrap and shearings £2 14s to £3 5s ($11.90 to $14.30); mixed wrought iron and steel scrap suitable for basic furnaces, £1 10s to £3 2s 6d ($6.50 to $13.80); heavy cast iron scrap in furnace sizes, £3 7s 6d to £3 15s ($14.90 to $16.60); good machinery scrap, £4 to £4 5s ($17.65 to $17.85).

Canadian Output

Shows Decrease for Iron and Steel in April—Imports Given

Toronto, May 29.—The monthly report on iron and steel issued by the dominion bureau of statistics states that pig iron production in Canada during April declined 9000 tons from the output in March. Pig iron production in April amounted to 32,572 long tons, comprising 12,142 tons of basic iron, 14,952 tons of foundry and 5478 tons of malleable. All but 104 tons of the basic iron was produced for the use of the makers. Practically all the foundry iron was produced for sale. The output of ferroalloys, principally 75 per cent ferrosilicon, declined from 1068 tons in March to 693 tons in April.

Production of steel ingots and castings declined from 29,941 tons in March to 21,935 in April. The April output included 20,513 tons of steel ingots and 1422 tons of direct steel castings. This is the lowest production recorded since monthly records were compiled. It amounted to only 24 per cent of the average April production during the ten years, 1911 to 1920.

In answer to inquiries in the Canadian house of commons as to the importation of steel during the first four months of 1922, information given by the government showed that the total quantity of steel plate imported for use in the manufacture of bridges, structural work and car construction was 2408 tons valued at $94,078. Rolled iron and steel beams, channels, angles and other rolled shapes, not further manufactured than rolled, and weighing not less than 31 pounds per lineal yard, and not including railway bars or rails, were imported to the amount of 9000 tons, of the value of $350,845.

The Underwood Typewriter Co., Hartford, Conn., has increased its operating schedule from four to five days a week. The company has decided to resume its profit-sharing plan. The amount to be distributed this year will be a fifth of the final net earnings.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

WITH the holding of the Pittsburgh sectional meeting last week, the American Society for Steel treating, now is focusing its attention upon plans for its annual convention and exhibition. This year the meeting will be held during the week of Oct. 2-7 in Detroit, a city of particular interest to members of the society due to the size of the automotive industry. Headquarters will be at the exhibition hall of the General Motors buliding, which will give the society one of the best locations it has ever had. The main room is 60 x 200 feet and is well supplied with electrical and gas connections. Practically all of the available space already has been taken in spite of the fact that two wings in the hall were made available after the main exhibition space was exhausted. It is estimated that over 200 exhibitors will be represented with booths and exhibits. Arrangements have been made to hold the technical and business sessions and entertainment features in the same building. This year it is planned to have fewer papers presented at the technical sessions, the idea being to allow considerable more time for discussion.

* * *

Discusses Steel Treating

James J. Curran, New Britain, Conn., presented the principal paper at the regular meeting of the Hartford chapter of the American Society for Steel Treating, held in Hartford, May 11. The subject was "Inspection and Heat Treatment of Steel."

* * *

Elect Chapter Officers

The New England Purchasing Agents association at its annual meeting in Boston recently elected George C. Bestwick of the Heald Machine Co., Worcester, Mass., president. Other officers chosen included vice-president H. D. Murphy of the American Radio & Research Corp. treasurer, E. E. Brainerd of the Merrimac Chemical Co.

Convention Calendar

June 5-7—American Boiler Manufacturer's association annual meeting at Buckwood inn, Shawnee-on-Delaware, Pa. H. N. Covell, 191 Dikeman street, Brooklyn, N. Y., is secretary.

June 5-9—American Foundrymen's association annual convention and exhibition at Exposition park, Rochester, N. Y. C. E. Hoyt, Marquette building, 140 South Dearborn street, Chicago, is secretary.

June 19-22—American Institute of Chemical Engineers, summer meeting at the Clifton hotel, Niagara Falls, N. Y. J. C. Olsen, Polytechnic institute, Brooklyn, N. Y., is secretary.

June 20-24—Society of Automotive Engineers meeting at White Sulphur Springs, W. Va. C. F. Clarkson, Scarborough-on-the-Hudson, New York, is secretary.

June 26-July 1—American Society for Testing Materials, twenty-fifth annual meeting, Chalfonte-Haddon Hall hotel, Atlantic City, N. J. C. L. Warwick, 1315 Spruce street, Philadelphia, is secretary.

Steel Jobbers Express Optimism

Members of American Iron, Steel and Heavy Hardware Association in Convention Believe Industry Faces Era of Prosperity—Urge That Restrictions Against Immigration Be Raised—New Officers Are Elected

MEMBERS attending the thirteenth annual convention of the American Iron, Steel and Heavy Hardware association at Washington May 23-25, differed as to what constitute "normalcy" and the heights to which wages may soar, but upon the proposition that there will be no return to prewar levels they were unanimous. W. L. Niekamp, of the Beck & Corbitt Iron Co., St. Louis, newly elected president of the association, declared "we will never see the time when wages are back to 1914" and predicted astounding wage scales in the future unless a large inflow of aliens is again permitted. He foresaw common warehouse labor getting $40 to $50 weekly in a short time. Andrew Wheeler, of Morris, Wheeler & Co., Philadelphia, retiring president, said he did not fear having to pay wages as high as Mr. Niekamp proposed, but asserted "there will be no return to pre-war levels—a 1914 basis is not to be dreamt of." "Normalcy" was defined as getting back to the same ratio of operating expense as before the war, and as a local business issue. An exposition of industrial currents as depicted in the BUSINESS TREND SECTION of THE IRON TRADE REVIEW by John A. Penton, of Cleveland, convinced many that a return to prewar conditions is not to be desired.

Save for the apprehension of soaring wages, the convention was marked with optimistic anticipation of the coming year. Every address radiated the conviction that the tide has definitely turned for the better and that the warehouse interests are again on firm footing. The time and place for holding the 1923 convention was delegated to the executive committee.

E. L. Parker, president of the Columbia Steel & Shafting Co., Pittsburgh, traced the growth of the cold-finished steel industry, pointed to the industry's annual capacity of 750,000 tons and cited that in the stress of war the industry had turned out 1,000,000 tons. In the past 10 years the differential received for cold-rolled steel has been $13 a ton over the hot-rolled bar price, while now the differential is only $10, which is not enough, Mr. Parker declared. Manufacturers must carry approximately 1000 sizes in stock. The price tendency is up, and the mills are operating at 60 per cent of capacity, according to Mr. Parker. In his address Mr. Penton asserted there is not a cloud on the industrial sky and advised association members to go long on stocking up and short on filling up their order books. He, too, referred to the necessity for permitting the arrival of more immigrants. Secretary of Commerce Hoover sketched the assistance being given industry by his reorganized department. James A. Emery, counsel for the National Association of Manufacturers, talked on "Combination and Business."

Officers Elected

President
W. L. NIEKAMP
Beck & Corbitt Iron Co., St. Louis
First Vice President
JOHN B. CARSE
Ogden & Wallace, New York
Second Vice President
C. R. WILLIAMS
Williams Hardware Co., Minneapolis
Executive Board
(Three Years)
H. C. BUSCH
Cincinnati Iron & Steel Co., Cincinnati
G. M. CONGDON
Congdon & Carpenter Co., Providence, R. I.
(One Year)
A. C. DIETRICH
E. Scott Payne Co., Baltimore

In his opening address, as president, Mr. Wheeler said:

"No industry has been more seriously affected than the steelmaking industry. With our own business of steel distribution, my worst enemy could not have wished me a poorer, leaner or more discouraging year from a business standpoint than this year. Those of us who had large overhead expenses in operating our plants and whose business was predicated on handling a large tonnage have probably been the worst sufferers. But I think you will all agree that our friends, the manufacturers, have been more severely hit. I have noticed that the warehouse man and the manufacturer usually feel the shrinkage in business in like proportion. In other words, when the manufacturer is operating at about 30 per cent of normal the warehouse man finds his business on about the same ratio of capacity.

In presenting the report of the iron and steel committee E. McK. Froment, of New York, said in part:

"Today steel—and by steel I mean all varied industries that go to make the iron and steel business of this country, is on the high road to recovery. We are no longer debating the advisability of giving our product away, but we are busied with the more comfortable problem of shall we sell now or shall we hold on until the coal strike makes the jeweler use gold nails for the boxes in which he packs his steel ornaments?

"We all believe that the steel business is much better. All business is better. Let us hope that those who regulate the mill prices will have vision enough to see that moderation is the handmaiden of prosperity and that extravagent advances in such prices will not mean an equal advance in business. At no time in the history of our business, at no time in the history of any business, has the story of the goose that laid the golden egg had greater application than today.

"For most of the past year mill-controlled warehouses have acted in a friendly manner in keeping the spread that, while not profitable, was at least fair considering the conditions to be met. But apparently they have much to learn in this respect. The action of the leading interest in cutting the warehouse spread from $3 to $5 per ton in the middle of March, in the face of a surely rising market, was a severe disappointment to all. Just why it did this is a matter of considerable interest. At any rate the warehouse spread does not show us a fair profit on our investment. It would seem that the mill-controlled warehouses have at last found out that it cost them something to cut structural material and plates. Let us hope that the $2 a ton differential on these items will be maintained. No man is big enough to stand alone. No man can prevail against those who are banded together for the accomplishment of that which is right and just."

"That there has been a change for the better within the last three months no one can gainsay; whether it is on account of the coal strike or whether it is a natural, normal increase in demand. This latter I am prone to believe. The tonnage rolled by the mills is gradually increasing until some, at least, are operating practically at full capacity. This improvement is likewise being felt by all of us, although the steel warehouse will feel the full effects of it some little time after it reaches the manufacturer.

"Many people have expressed the opinion that the present coal strike has a good deal to do with the increased operation, and it may be that this is a fact in some quarters. The fact remains, however, that building operations on a large scale formed the first real tonnage which marked the beginning of the improvement. This was followed by larger purchases from the railroads, which are now reaping the benefits of the war-time passenger and freight rates, which are still in existence.

"The automobile industry seems to have taken on a new impetus, notwithstanding the fact that it is hard to believe that there could be such a vast number of buyers for them. There is evidently an enormous amount of money in this country, as evidenced by the tremendous transactions in the stock

exchange, and the rapidity with which good investments are absorbed. The foreign exchange question is still unsettled and will be, I fear, until after the European nations can so readjust their finances as to be able to engage once more largely in world-wide export and import business.

"The probable merger of five or six large independent mills together with the recent amalagamation of the Lackawanna and Bethlehem companies, will, as I take it, have a beneficial effect on the stabilization of the market as well as on the economic features that will be made possible by this consolidation. I believe that it will all work to the ultimate advantage of the warehouses."

Mr. Niekamp presented the report of the executive committee of the association, which said in part:

"It was apparent at our last annual meeting at Montreal that the warehouse business was in for an unprofitable period, and subsequent events bore out to the fullest extent the most pessimistic thoughts of our members. We were not only in for a period of operating loss but depreciation in inventory dug deep into our surplus accounts.

"In the heavy hardware lines the declines in prices were not nearly so great as in the iron and steel lines, and on some items no change whatever in price was made. I refer especially to horseshoes, which advanced but little during the war period, and we are reliably informed that at this time there is little possibility of any decline in this commodity.

"Business generally in the heavy hardware and wagon supply lines was considerably better than in the strictly steel end. Sales were from 50 to 50 per cent of the previous year's volume, and where this line was sold in connection with iron and steel a fairly-good year was completed. Your committee is of the belief that those who are still in the wagon supply line will find this business remunerative, as a great many of the handlers of these lines have discontinued them, which should reflect itself in increased business to those who still remain."

In a letter Harry G. Uphouse, manager of sales, Donner Steel Co., Philadelphia, said:

"Plates are the weakest commodity, due to the excess of ships remaining after war requirements. Jobbers have, in common with steel mills, been hard hit the past year and a half, due to the heavy deflation necessary to get back to prices which would encourage general buying. Steel mills, due to high cost of raw material, high freight rates and the like, have been dispensing of their product at an absolute loss. At the present time stocks are at a minimum. Steel shipped from the mills this year has readily been consumed. Jobbers who failed to take advantage of this opportunity to replenish their stocks during the past three months will probably find that they have missed their market.

"Steel mills have all the business they can handle to advantage. The chances are that business would be generally better without the coal strike; its only effect was to add impetus to a growing demand. In the meantime, loss of coal traffic is cutting into the earnings of railroads, which tends to hold back equipment orders in large volume. Indications point to a large demand upon jobbers' stocks and this demand will be increased should the coal operators and miners fail to get together within a reasonable length of time. This analysis points distinctly to higher mill prices, due primarily to higher labor, scrap and fuel costs—the latter being accentuated by the uncertainty of the outcome of the coal situation. This should be reflected in a sustained demand for jobbers' stocks at higher price levels."

An informal discussion on the effect of abandoning the Pittsburgh basing point practice brought out majority sentiment that the practice exerts a good stabilizing influence but that if it is abandoned the establishment of f.o.b. mill prices is preferable to creating of bases at Chicago, Duluth, Birmingham and other points. Reports were submitted by committees on cold finished steels, blacksmiths' supplies, bolts and nuts, wagon and carriage supplies, horseshoes and motor accessories. Informal talks on various subjects were participated in by practically every member attending.

South America Revives

Best Outlook for Iron and Steel Exporting Shown by Southern Republics—Some Chinese Buying—Philippines Place Orders

NEW YORK, May 29.—Although decidedly unspectacular, developments in iron and steel exporting during the past two weeks strike a favorable balance. Foreign trade as a whole, following the sharp decline of some weeks ago, still occupies a very subnormal position, but trade activities in the past fortnight have maintained a slight gain.

The center of interest very clearly is shifting from the Far East to South American markets. Merchant inquiry in Japan is at a low ebb.

Bids were opened May 25 for two lots of bridge material for the Japanese government, one totaling 363 tons for delivery at Kobe and the other slightly in excess of 200 tons. On this same date the Nippon Oil Co. received tenders for 28,000 boxes of tin plate, oil can size. Action is being awaited on two inquiries for rails from private sources. Strong continental competition was expected on an inquiry received some time ago for 48½ miles of 75-pound rails for delivery at Mogi. A second inquiry for 50 miles of 60-pound rails for delivery at Yokohama remains pending. An American exporter with connections in both China and Japan reported no business pending other than an inquiry from Japan for 200 tons of automobile sheets for repair purposes. Exports of copper to China continue, one exporter reporting a sale of 300 tons and an inquiry for 180 tons. While this metal is declared to be for minting purposes, the persistence and volume of these inquiries is leading some to believe that a large part of this metal is going into ammunition. A sale of 600 tons reinforcing bars to a Hong Kong merchant was reported late last week, delivery to be made in June and July. Inquiry for wire shorts and plate cuttings from China are far in excess of the supply. Another American exporting company reports the sale of 2000 kegs of nails for July delivery to Hong Kong.

This same agency has been doing a good business in the Philippine islands, reporting 3000 kegs of nails and 350 tons of sheets sold in the last two weeks. The combination of circumstances brought about by the simultaneous firming of prices in this country, the advances in ocean rates on the Pacific and slackened demand in the Far East, renders difficult any observation as to European competition in the Far Eastern market. It is known, however, that some business is being lost by American producers. One New York exporting house which has international offices reports a recent Japanese inquiry for 250 tons of sheets was placed with English sheet mills at a figure which American makers could not meet. Another inquiry for 130 tons of angles to Japan was placed with a German mill.

Expressions relative to South American demand for steel products are unanimously favorable. Of all South American countries the Argentine undoubtedly is in a leading position at the present time, but Brazil and the countries on the west coast have improved their exchanges very materially in the recent past, and inquiries are being reported from all parts of South America. The greatest demand is for wire and wire products. One New York interest which is very active in the River Platte district announces that more than 3500 tons of these products were purchased in the last three weeks.

The Dwight P. Robinson Co., New York, recently awarded 400 tons of structural steel to the United States Steel Products Co. for the American exposition buildings at the Brazilian Centennial Exposition to be opened in Rio Janeiro next September.

Discuss Heat Treating Problems

Important Papers Presented at a Two-Day Sectional Meeting of the American Society for Heat Treating Aroused Considerable Interest—Essential Details Dealing with the Art of Heat Treating Are Brought Out

FOLLOWING out the recent plan of its board of directors to hold sectional meetings in different parts of the country, the American Society for Steel Treating held technical sessions May 25-27 at the bureau of Mines, Pittsburgh. Over 225 members of the society associated with the Pittsburgh, Cleveland, Rochester, Syracuse and Buffalo chapters were in attendance.

Thursday afternoon's session was opened by N. B. Hoffman, metallurgist, Colonial Steel Co., Pittsburgh, who recently succeeded C. M. Johnson. After extending an address of welcome in behalf of the Pittsburgh chapter the meeting was turned over to Chairman C. M. Johnson, Crucible Steel Co. of America, Pittsburgh. A paper entitled "Fiber in Steel and Iron" was presented by Prof. F. F. McIntosh, metallurgical department, Carnegie Institute of Technology, who compared the structure of steel to wood and pointed out that to obtain desirable results in forging and rolling the grain in the steel must be given careful consideration. His paper resulted in lengthy discussion. He stated only little effort is being expended to control the subject of fiber in steels and that the subject was important although not obvious on the surface. According to Professor McIntosh, fiber goes back to the ingot, is determined in the furnace and the mold and only can be stretched and elongated. Factors governing its formation are the condition of cooling and the extent of deoxidation of the steel. Many photomicrographs accompanied the presentation of his paper.

Following Professor McIntosh, a paper entitled "Influences on Mass Heat Treatment" was presented by W. B. Crowe, metallurgist, Carnegie Steel Co. who touched on some of the difficult points of mass heat treatment and pointed out various contributory causes of failure which should not be chargeable to poor heat treating. Mr. Crowe said in part:

"Of the several influences on mass treatment the majority occur before the actual operation of heat treating. Mechanical design is an important factor of influence and in a large measure controls the character of the heat treatment to be employed. It may render the process of treating extremely difficult, if not unsafe, and may even make satisfactory treatment impossible.

"As mass dimensions are increased the effects of composition become more pronounced. Examinations under the microscope of specimens taken near the axes of the masses reveal that the masses which had the deepest chill showed the finest microstructure after a drawback. Little relation exists between the physical properties of small and large masses nor can the heat treatment be depended upon as a guide for the treatment of large masses except in a general way.

"It may be necessary in order to meet the physical requirements to employ the more susceptible-to-hardening types of steel and where the mass is of such a shape as to render water quenching a great hazard on the lower types of steel, the operation may be rendered far more safe by using the higher type steels without severe quenching.

"Masses of irregular section, which tend to develop cracks in the thinner section, when quenched present a problem which requires considerable study and experience. It often is necessary to retard the rapid cooling of the thinner section by the application of some nonheat-conducting material, such as sheet asbestos or yellow clay with wire reinforcements or any material which will equalize more the rate of cooling and reduce local strains."

The final paper on Thursday afternoon's session entitled "A Discussion of Impact Testing Methods and the Results Obtained" was presented by John M. Lessells of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Mr. Lessells pointed out that the quality of the heat treated product must be determined by recognized and accepted physical tests. If it can be established that some new test shows up characteristics in a heat treated steel which the accepted and more or less conventional tests do not show, then this test should be favorably regarded to get the best from materials. Since the impact test appears in this category, he presented various facts on this method first describing the operation and design of four forms of impact testing machines. Mr. Lessells said:

"While it is stated that a notch brittle, nickle chrome steel shows a crystalline impact fracture and is an undesirable material, the converse does not necessarily hold, that is, a crystalline fracture may not by itself demonstrate an undesirable material. The nature of these fractures may be judged in the light of their relation to the composition and the mechanical properties of the material. A crystalline fracture in medium carbon material as rolled may not be bad because this is normal for that material, but such a fracture for nickel chrome is abnormal and to be avoided.

"There is still another feature of the impact test must be considered, that is, the value of this test as indicative of the structure from examination of the fractured specimens. The tensile test is valuable in view of its being the respositore of a great deal of knowledge gained from its extended use. In a similar manner, an actual examination of fractured impacts will also contribute to making these tests valuable when these have been adopted more widely than at present. For example, and one which is by no means an isolated one, a material in the notch brittle condition always shows a crystalline impact fracture, while the corresponding tensile fracture is fibrous. It can be concluded, therefore, that such a material is unsuitable for structural purposes.

"Although it is difficult and dangerous to make definite statements in favor of any particular test conclusions that appear to be warranted are that the impact test is one of the most sensitive mechanical tests so far introduced to determine the design of heat treatment given to a material; it shows up characteristics in certain materials which tensile tests do not indicate; it corresponds along with other physical properties such as reduction of area to the variation in heat treatment and is therefore valuable for confirmatory purposes; and it offers valuable evidence, by observation of the fracture, relative to the thermal treatment which the material has received."

During the evening over 100 members and guests of the society assembled at the University club where an informal dinner was served. Addresses and music were broadcasted by the Westinghouse radiophone station. The after dinner meeting was presided over by G. H. Neilson, president, Braeburn Steel Co. Braeburn, Pa., and past president, Engineers Society of Western Pennsylvania. Speakers of the evening included Doctor Bowman, chancellor, University of Pittsburgh. Prof. F. Crabtree, chairman, Crucible Steel Co. of America, Pittsburgh, Prof. F. Grabtree, chairman, American Institute of Mining and Metallurgical engineers, Pittsburgh division; and vice chairman, Engineers Society, Western Pennsylvania, and W. P. Woodside, Studebaker Corp., Detroit, and first chairman, Steel Treaters Research Society now amalgamated in the American Society for Steel Treating. Dr. Mathews spoke on "Metallurgical Miscellany."

Assembling at the William Penn hotel Friday morning the members were taken by automobiles to the Homestead works of the Carnegie Steel Co. where they were shown through the rail and sheet bar mills and the bessemer and open-hearth departments. The party then visited the plant of the Westinghouse Electric & Mfg. Co., and after being shown through the various departments were guests of the company at a noonday luncheon.

During Friday afternoon the second technical session was held with Prof. H. M. Boylston, Case School of Applied Science, Cleveland, presiding. The author, A. M. Cox, president and treasurer, Pittsburgh Commercial Heat Treating Co., Pittsburgh, who pointed out that the application of various types and grades of steel has brought forward the fact that any one steel cannot be used indiscriminately but must be studied in relation to the service for which it is intended. He showed by a series of curves and micrographs thrown on the screen the results of various tests in line with his subject. The result of the tests conducted by Mr. Cox indicate that the greater the density and hardness, the greater the abrasive resistance; the ordinary tension and Brinell tests are not a reliable index to the abrasive qualities of a material; carbon steels show more uniform results than chrome nickel steels and less average wear loss; and that further tests are essential to determine the combined effect of ductility and hardness on the abrasive properties of materials.

The second paper at the Friday afternoon session entitled "Importance of the Proper Heating and Cooling of Steel" was presented by John A. Succop, Heppenstall Forge & Knife Co., Pittsburgh. He stated:

"From the study of metallurgical results of finished products, heat treated in an indicated uniformly heated furnace, we find that a variation frequently is found. The best test of uniformity of a heat treated piece of steel is the manner in which the load cools. To heat uniformly it is necessary that each piece be subjected to the heat in the same manner, at the same temperature, and for the same length of time in proportion to the size of the section.

"If a large amount of material is placed on one end of the furnace charge, it is likely that the outside pieces will be heated too and cooled from a higher temperature than the pieces at the center of the mass. Likewise with cooling, if a large mass is plunged into a quenching tank, there is a tendency for the temperature of the bath to become irregularly heated, and also for the outside of the mass to cool at a different temperature and in a different temperature and in a different period of time than the center.

"With large masses, it is unreasonable to suppose that each portion of the section receives the same amount of heat that the other portions received, and that it is subjected to the same heat treatment. Unless all pieces are heated and cooled exactly alike, the pyrometer indications of uniform temperature serve merely as evidence, but cannot be accepted as proof of a uniformly heated furnace, or a uniformly heat treated furnace charge, or a uniformly heat treated product, as a final result. There should be better appreciation and understanding of the difference between a pyrometer record, which indicates a uniform temperature and of the conditions which bring about the uniformity desired in the furnace.

"The practice of heat treating without regard to the mass and surface and with an eye only on the record of the pyrometer, will always produce a nonuniformly heated product. The mass should be treated and not the pyrometer. The pyrometer does not indicate anything concerning the temperature of the mass, but only the temperature of the portion of the gases in the furnace or the material with which it comes in contact. Proper consideration must be given to the human element involved. Those in charge should be educated and should in turn educate those within their charge, for upon them lies the future of subsequent operations."

Concluding Mr. Succop said a uniformly heated product requires more than a uniformly heated furnace; material cannot be heat treated satisfactorily when the record of the pyrometer is the only guide; the human element plays an important part in the proper heating and cooling of steel; and, that great care must be exercised in the handling of steel to insure proper thermal expansion and contraction. This is secured only through proper loading, charging at a low temperature, and by slow firing.

A paper entitled "Manufacture of Springs" by D. A. Smith, Union Spring & Mfg. Co., New Kensington, Pa., was read by proxy. The last paper entitled "Change in Dimensions of High Speed Steels in Heat Treatment" was presented by M. A. Grossman, metallurgist, Electric Alloy Steel Co., Charleroi, Pa., who explained his method of measuring the change in length of a test specimen after heat treating. Several charts were displayed from which was deduced that there always is an expansion on hardening and that this expansion is greater the higher the quenching temperature up to a certain point. The subsequent contraction on heating up to 900 degrees Fahr. also is greater the higher the quenching temperature. His comparison of three different steels in common use showed that the first expansion is greater in the lower tungsten steels, and that the second expansion, namely at 1100 degrees Fahr., is greater in the higher tungsten steels. A further important point is that while the lower tungsten steels can be heat treated to develop a reasonably large amount of austenite, the heating in the highest ranges causes overheating, coarse grain, and its accompanying brittleness with excessive blistering of the surface. The higher tungsten steels can be heated to temperature high enough to develop a considerable amount of austenite, and still retain a fine-grained structure with its accompanying advantages.

Friday evening a smoker was held in the auditorium and cafeteria of the bureau of mines during which a film was shown depicting open-hearth steelmaking as practiced by the American Rolling Mill Co., Middletown, O. A directors and executive meeting was held Saturday morning. Saturday evening a large number of the members attended a play given by the school of dramatic arts, Carnegie Institute of Technology.

Alloy Steel Plant Merger Has Been Formulated

L. J. Campbell, president of the Electric Alloy Steel Co., Youngstown, O., and Arthur H. Hunter, president of the Atlas Crucible Steel Co. of Dunkirk, N. Y., announce that after a series of meetings of officials, prominent stockholders and financial interests of their respective companies, a plan of merger for the two corporations has been agreed upon, and that this plan will be presented at meetings of the directors of the companies to be held this week.

The plan provides for immediate plant expansions at Dunkirk, considerably increasing the Atlas productive capacity, and also some plant extensions at the Charleroi works of the Electric Alloy Steel Co. With these extensions, the capacity of the new company for quality alloy steel production will be the second largest in the United States.

The merger plan provides adequate working capital. The new company as at present constituted, will own and operate plants at Dunkirk, N. Y., Charleroi, Pa., and Welland, Ont. It also has a large site acreage at Niles O., for future development.

The merging companies have been prominent in the production of quality steels, and the personnel of the combined boards of directors included a number of business executives including James A. Campbell, president of the Youngstown Sheet & Tube Co., C. H. Wills, president of the C. H. Wills Motor Co., T. J. Bray, president of the Republic Iron & Steel Co., Jonathan Warner, president of the Trumbull Steel Co. and J. J. Bernet, president of the Nickel Plate railroad.

Steel Exports Well Maintained

April Tonnage Declines Only 8912 from March, Totaling 197,562 Tons—Imports Reach Largest Volume since Last May, Aggregating 15,884 Tons—Iron Ore Imports Drop to Small Figure—Manganese Ore Gains

WHILE nearly 9000 tons less than the total exported in March, iron and steel exports in April totaled 197,562 tons. This compares with 206,474 tons shipped overseas in March, an actual difference of 8912 tons. Compared with April of last year, however, when these exports amounted to 160,921 tons, this is an increase of 36,641 tons, and indicates maintenance of the apparently higher level of foreign business American exporters and manufacturers are enjoying this year over last.

April's loss of tonnage from the March figure was due chiefly to lesser exports of black sheets and steel rails. Black sheets declined from 37,964 tons to 29,171 tons and rails from 24,775 tons to 15,502 tons. Other decreases also were made in galvanized sheets, tin plate, pipe, wire nails and a few other products.

Against these were increases in iron and steel bars, scrap, structural steel and other items. Iron and steel bars increased from 17,579 tons in March to 32,307 tons in April; scrap gained from 5736 tons in March to 10,599 tons in April and structural steel reached 8060 tons as compared with 3360 tons in March.

Other individual products compared as follows: Wire rods 6998 tons in April and 8030 tons in March; hoops, bands, scroll and strips, 2806 tons in April and 3188 tons in March; track material, 2887 tons in April and 1840 in March; plain and galvanized wire, 12,413 tons in April and 13,538 tons in March; and barbed wire, 5531 tons in April and 4449 tons in March.

April imports of iron and steel totaled 15,884 tons, the largest tonnage received at American ports since May last year when the receipts aggregated 23,316 tons. This was largely due to increased bookings of foreign pig iron which in April amounted to 5968 tons as compared with 1871 tons in March. Scrap importations also were larger, totaling 4330 tons as against 2844 tons in the preceding month. Another steel product admitted in larger tonnage than in March, was rails. Imports were of 3149 tons in April and 12 tons in March. Tin plate in April dropped to 144 tons from 1223 tons in the earlier month.

Iron ore imports reached the lowest tonnage imported in a long time. Only 2710 tons came in during April, as compared with 12,013 tons in March and 35,645 tons in April last year.

Other ores and ferroalloys increased in imports in April, as compared with March, going up to 28,395 tons from 9286. In April, 1922, it was 49,940 tons.

IMPORTS AND EXPORTS

Gross tons

	1922 Imports	1922 Exports	1921 Imports	1921 Exports
Jan.	10,511	155,822	15,784	516,447
Feb.	10,216	133,333	3,650	387,900
March	8,612	206,474	14,492	210,451
April	15,884	197,562	4,847	160,921
May			23,316	142,553
June			8,260	119,021
July			10,040	85,520
Aug.			8,069	75,641
Sept.			11,743	94,650
Oct.			10,609	106,466
Nov.			9,296	125,492
Dec.			9,400	134,348
Total	45,223	693,191	129,506	2,158,384

Year	Imports	Exports
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

FERROALLOY EXPORTS

Gross Tons

	April 1922	April 1921	Ten months ending April 1922	Ten months ending April 1921
Ferrosilicon	...	...	363	523
Ferromanganese	241	218	925	3,335
Spiegeleisen	36	...	338	...
Ferrovanadium	3	1	25	202
	280	219	1,661	4,060

IRON AND STEEL EXPORTS

Gross Tons

	April 1922	April 1921	Ten months ending April 1922	Ten months ending April 1921
Pig iron	2,750	1,234	22,447	121,451
Scrap	10,599	2,622	38,332	174,745
Semifinished steel*	9,376	678	28,048	80,694
Iron and steel bars†	32,307	8,289	103,606	493,517
Alloy steel bars	173			
Wire rods	6,998	1,402	33,191	58,434
Boiler plate	2,558	29,014	83,189	734,729
Other plates	10,526			
Galv. sheets	8,748	4,174	62,058	87,171
Black sheets, steel	29,171	7,194	240,891	137,860
Black sheets, iron	793	(a)	5,333§	(a)
Cold rolled strips	173	1,014	17,970	36,188
Hoops, bands and scroll	2,633			
Tin and terne plate	4,663	3,406	64,102	173,982
Fabricated plates‡	58	1,239	2,895	29,719
Struc. steel, plain	5,485	19,891	129,011	490,498
Struc. steel, fabricated	1,533			
Other struc. forms	1,042			
Rails, over 50 pounds	15,502	31,390	87,720	505,758
Rails, under 50 pounds	2,389			
Railroad spikes	676	910	4,173	13,231
Track fastenings and material	2,887	(a)	7,893§	(a)
Boiler tubes	791	36,101	125,893	373,135
Casing and oil line pipe	3,647			
Welded black pipe	6,499			
Welded galv. pipe	2,948			
Malleable iron pipe fittings	767			
Cast iron pipe	1,369	4,790	26,919	68,305
Cast iron pipe fittings	993			
Plain wire	3,318	3,580	86,382	162,369
Galv. wire	9,095			
Barbed wire	5,531	970	25,747	84,153
Manufactures of wire	2,397	(a)	8,783	(a)
Cut nails	234	12	1,887	3,406
Wire nails	6,775	767	40,614	72,052
Other nails including tacks	507	255	3,264	9,276
Bolts, nuts, rivets and washers	1,651	2,049	11,439	35,151
Total	197,562	160,921	1,261,787	3,945,825

*Includes ingots, blooms, billets, slabs, sheet and tin plate bars and skelp.
†Includes rods other than wire, and light structural forms.
‡Ship and tank plates punched and shaped.
§Four months, separately stated.
(a) Formerly by value.

IRON AND STEEL IMPORTS

Gross Tons

	April 1922	April 1921	Ten months ending April 1922	Ten months ending April 1921
Pig iron	5,968	2,781	30,146	45,195
Scrap	4,430	1,284	33,677	80,461
Bar iron	541	10	2,602	3,468
Ingots, blooms and billets	1,412	254	14,780	7,902
Structural shapes	160	75	1,135	1,249
Rails	3,149	298	19,557	28,744
Sheets and plates	11	2	271	2,375
Tin plate	144	80	2,083	463
Wire rods	69	63	1,055	4,577
Total	15,884	4,847	105,306	174,434

IRON ORE IMPORTS

Gross Tons

From	April 1922	April 1921	Ten months ending April 1922	Ten months ending April 1921
Spain	....	....	15,758	26,496
Sweden	....	35,303	27,817	108,426
Canada	....	305	3,740	18,897
Cuba	....	....	47,147	525,448
Other countries	2,710	37	6,332	188,219
Totals	2,710	35,645	100,794	867,486

IMPORTS VARIOUS ORES AND FERROALLOYS

Gross Tons

	April 1922	April 1921	Ten months ending April 1922	Ten months ending April 1921
Ferromanganese	2,380	2,115	12,411	42,857
Ferrosilicon	456	191	8,905	6,659
Manganese ore	25,559	47,260	166,362	610,938
Tungsten-bearing ore	....	109	640	1,153
Nickel ore	....	265	149	17,333
Total	28,395	49,940	188,467	678,490

CASTING AND FORGING EXPORTS

Gross tons

	April 1922	Four months of 1922
Malleable iron castings	199	504
Other iron castings	906	3,043
Car wheels and axles	1,278	5,967
Shells and projectiles, empty	155	157
Iron and steel forgings	237	688
Steel castings	110	795
Total	2,865	11,154

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

FOR the purpose of refinancing and taking over the business of the Gardner Bryan Co., Cleveland, manufacturer of taps, dies and screw plates, the Gardner Tap & Die Co. has been incorporated. Officers of the company are: President, F. W. Wood, who is also president of the Wood & Spencer Co. and the Cleveland Castings Pattern Co.; vice president and sales manager, J. M. Gardner; treasurer, R. H. Smart; and secretary, D. G. Miller, secretary of the Wood & Spencer Co. and the Cleveland Castings Patern Co. The directors of the new company include the officers and A. K. Spencer, vice president of the Wood & Spencer Co., and the Cleveland Castings Pattern Co.; F. H. Wood and F. E. Gardner.

* * *

THE Allis-Chalmers Mfg. Co. recently received an order for a 400-barrel mill from the Colorado Milling & Elevator Co., for its branch mill at Weiser, Ida.

* * *

CAPACITY of the Commercial Forgings Co., 3709 East Ninety-first street, Cleveland is to be increased by the purchase of a 4000-pound hammer for which the company is making inquiry. It has added a 26-foot lathe and a drill press to its equipment and now is operating full time.

* * *

IN order to bring its steam plant up to the requirements of the rest of the company's operations, the Kirk-Latty Co., Cleveland, maker of bolts, nuts and rivets, is spending $10,000 in its enlargment. This addition will not increase the manufacturing capacity which has been enlarged considerably in the past few years. The new steam plant is to be of modern construction, according to F. H. McIsaac, treasurer.

* * *

ANNOUNCEMENT has been made by E. E. Helm, industrial manager of the Akron chamber of commerce, that the Blake-Fitchburg Pump Co., Fitchburg, Mass., will move its factory to Akron and the company will be reorganized under Ohio laws as soon as a suitable site is found. The company's machinery and equipment is listed at $178,000 and has cash assets of $100,000.

* * *

CONFUSION of its name with that of another company, has caused the Arrow Tool & Mfg. Co., Bridgeport, Conn., effective June 1, to change its name to the Forsberg Mfg. Co. The company will not change its ownership or management and will continue to make tools, machinery and stampings. An addition of a press room has been made to the plant and the company has added a line of hack saw frames and sheet metal products.

* * *

REORGANIZATION of the Dayton Coal & Iron Co., Dayton, Tenn., has been effected with the election of Arthur N. Wilkshire as president, John T. Pell as vice president and Henry T. Sheldon as secretary and treasurer. Properties of the company, which are 40 miles from Chattannooga, include two blast furnaces, coke ovens and coal, iron and limestone tracts. Plans call for their operation shortly.

* * *

DEFINED about a year ago, a project of the Nash Motors Co., Kenosha, Wis., has been revived for the enlargement of its 4-cylinder passenger car factory in Milwaukee. An expenditure of $250,000 is to be made by adding a 3-story building, 100 x 400 feet, for sheet metal work and body construction. Ground has been broken. The general contract has been taken by the Worden-Allen Co., Milwaukee. The new shop will be completed about Aug. 15 and will make it possible to enlarge the output, now limited to 55 or 60 cars a day.

* * *

FOREIGN department of Joseph T. Ryerson & Son has been moved from Chicago to the company's branch offices, 30 Church street, New York. Paul H. Petersen, associated with this department for six years, will be in charge, succeeding H. B. Kraut, who will act as technical manager of the machinery department. The department as in the past will handle both steel and machinery. The company has foreign offices in London, Paris, Tokio, Sydney, Rio de Janeiro, Buenos Aires, Lima and Toronto.

* * *

MANAGEMENT of the Madison Tool & Stamping Works, Madison, Wis., specialty manufacturer, recently was changed. The executive staff now is as follows: President, H. A. Hass; vice president, William Gergersen; treasurer and general manager, James H. Jordan; secretary, C. E. McCampbell; and office manager, L. J. Maisel. The companny manufactures tools, dies, metal stampings, models and metal patterns and engages in instrumental work both electrical and mechanical and all kinds of machine work and manufacturing.

* * *

NEW quarters have been taken by the Westinghouse Electric & Mfg. Co.'s branch at Second avenue and Ninth street, Huntington, W. Va. In this 3-story building, containing 30,000 square feet of floor space, the activities of the sales, service and warehouse departments have been co-ordinated, and this, with the furnishing of more adequate facilities, is expected to result in further benefits in service to customers. The Westinghouse company plans also to maintain its offices at Bluefield and Charleston, W. Va. The building was erected by the company and is known as the Westinghouse Electric Building.

* * *

HEYL & Patterson, Inc., 50-53 Water street, Pittsburgh, formerly engaged in the pulverized fuel business until the death some time ago of E. C. Covert, have re-entered the industry with the appointment of C. F. Herington as contracting engineer in charge of the department. Mr. Herington has been engaged in designing, selling and installing pulverized coal plants for metallurgical furnaces and boilers for nine years. The company, of which W. J. Patterson is president and general manager and E. W. Heyl vice president and treasurer, produces a pneumatic system for distributing pulverized fuel and another for conveying pulverized coal by compressed air.

Rail Rate Decision Is Criticized

Administration Officials Believe Commerce Commission Made Mistake in Declaring for Horizontal Decrease—"Better Than Nothing," Is General Attitude—New Tariffs May Be Made Effective Before July 1

WASHINGTON, May 29.—On the supposition that the interstate commerce commission will now reject the 20 per cent reduction in ex-lake iron ore rates and the 28 per cent cut in station-to-station rates on ore in eastern territory, which the commission suspended in April, the lakefront blast furnaces are claiming an advantage over the interior furnaces in the readjustment of freights resulting from the commission's 10 per cent horizontal reduction.

Had the Buffalo furnaces not protested the 20 per cent decrease in ex-lake ore, to have been effective April 17, the rate on ore to Pittsburgh now would be 92 cents a gross ton. Beginning July 1 the rate will be $1.14. On two tons of ore the saving to the interior furnaces thus will be 44 cents less than had not the Buffalo furnaces demanded suspension of the tariffs. On coal from the Pittsburgh district to Buffalo the new rate will be $2.24 instead of $2.51 and on coke from Connellsville to Buffalo the new rate will be 36 cents under the present rate of $3.64. Considering, too, that much fuel in the Pittsburgh district is water-borne, the Buffalo furnaces see their position improved strategically.

The commission's decision prompts the belief that the suspended ore tariffs in eastern territory will be permanently set aside, thus concluding the case prompted by their suspension. The decision does not, however, affect the Adriatic Mining case, as upper lake ore rates were not advanced in August, 1920, and consequently are not now decreased. This case still will be pressed to conclusion. Briefs in the minimum ore case, involving the Buffalo furnaces, will be filed and the case pressed to conclusion, as the horizontal reduction leaves the coal, coke and ore rates in substantially the same relative position. Any decrease in upper lake ore rates will, of course, affect interior and lakefront furnaces alike.

Railroad executives have not yet informed the commission whether they will accept the 10 per cent reduction without a formal order, and will take the matter up this week at regional conferences. Should the carriers be disposed to be obstructive, they could force the commission to go through the form of issuing the formal order, which may possibly postpone the effective date a few days but will not affect the extent of the cut. There seems to be little ground for the belief that the carriers will reduce some basic commodities more than 10 per cent.

It has now developed that the President made strenuous efforts to have the form of the reduction differ from what actually was handed down by the commission. On the advice of Secretary Hoover, the President urged the roads to wield the knife vigorously on basic commodities, even if some class rates had to be increased. At his dinner with railroad executives a week ago Saturday he informed the executives that unless they acquiesced in commodity reductions the commission would issue its 10 per cent reduction. This was what prompted the President to say, within 18 hours of the time the commission handed down its decision, that class rates were not under discussion. Secretary Hoover frankly believes the commission has made the same mistake it did in raising rates horizontally in 1920. Incidentally, neither Secretary Hoover nor anyone here believes there is the slightest chance for the proposal of high treasury officials to leave the railroads fix their own rates for five years.

A conservative estimate of the amount of reduction in railroad revenue resulting from the decision is $225,000,000. The reductions already made in the grain, livestock and lumber cases aggregate $186,000,000. Thus, railroad revenues have been pared approximately $411,000,000 since the rise of August, 1920. Meanwhile, the railroad labor board has cut wages $350,000,000. The railroads now have before the board their case asking for the removal of the remainder of the 1920 wage increase, or $300,000,000 additional.

In that its decision affords reduced freights all along the line the commission was politic. All of the comment in Washington, however, is critical. The President and Secretary Hoover believe industry would have been stimulated more by concentrating the $225,000,000 on a few basic commodities instead of spreading it thinly all over the rate structure. Secretary Hoover is strongly of the opinion, for example, that greater good would have come to industry by having reduced raw materials drastically and left the finished products as they were. In view, however, of the differing opinions of the 11 members of the commission it is felt that the 10 per cent cut should be received with gratitude.

The commission's decision cuts 10 per cent off all rates except for two classes, rates that were not increased in 1920, such as upper lake ore, and rates that have been decreased since 1920. The 10 per cent cut is effective in those instances where rates have been lowered to correct maladjustments.

Freight Costs in the Making of Iron

FREIGHT rates for assembling raw material for the manufacture of one ton of pig iron at valley furnaces, compared, are as follows:

JAN. 1, 1913	
Ore (2 tons)	$3.16
Coke (1.11 tons)	1.50
Limestone (0.54 tons)	.22
Misc. supplies, estimated	.05
Total	$4.93
SEPT. 26, 1920 (PEAK)	
Ore	$6.21
Coke	2.80
Limestone	.45
Misc.	.20
Add 3% war tax	.29
Total	$9.95
PRESENT RATES	
Ore	$5.71
Coke	2.80
Limestone	.45
Misc.	.20
Total	$9.16
NEW RATES	
Ore	$5.48
Coke	2.52
Limestone	.41
Misc.	.18
Total	8.59
Saving on 1 ton of pig iron =	$0.57.

Note—In figuring "new rates" no reduction has been considered as allowed on the haul from mines to upper lake docks. Unloading charges from hold of vessel were raised 40 per cent, Aug. 26, 1920, and therefore the reduction has been applied to them. In all the above calculations vessel rates have been included in ore transportation costs.

Commission Sums Up Its Findings

WE ARE of opinion that general reduction in the rate level, as substantial as the condition of the carriers will permit, will tend not only to lessen the transportation burden but also to equalize and stabilize the conditions under which commerce and industry are carried on, with consequent fuller assurance to the carriers of realizing the fair return contemplated by the law.

"The justification for decrease is to be found in the rate structure as a whole rather than in individual rates or in rates on individual commodities.

It is true that the price of some commodities have receded more rapidly and to a greater extent than others, even as some went up more rapidly and to a greater extent than others. Readjustment, however, is not complete and the process of equalizing prices is still in progress, some coming up and others going down, which will probably result in a more equal price level in the near future. The needs of commerce can not be met if rates are to fluctuate with market prices of commodities. In bringing down the rate level to meet lowered expenses a similar process should be followed and the reduction made generally upon all commodities in substantially equal ratio.

"After considering all the facts of record, including the necessity of reasonable expenditure for additions and betterments, we find and determine:

"1. That on and after March 1, 1922, a fair return upon the aggregate value of the railway property of the carriers will be 5.75 per cent of such aggregate property value as a uniform percentage for all rate groups or territories designated by this commission.

"2. That the existing freight rates and charges, including charges for switching and other accessorial services and all other charges applicable to freight service which were increased by authority of *Increased Rates*, 1920, *supra*, will be on and after July 1, 1922, unjust and unreasonable to the extent that they may respectively include more than the following percentages of increase over the rates in effect immediately prior to Aug. 26, 1920:

"In the eastern group, also between points in Illinois territory and between Illinois territory and the eastern group, 26 per cent instead of the 40 per cent authorized in the decisions last cited.

"In the western group, and between the western group and Illinois territory, 21.5 per cent instead of the 35 per cent so authorized.

"In the southern and mountain-Pacific groups, 12.5 per cent instead of the 25 per cent so authorized.

"On interterritorial traffic, except as otherwise provided herein, 20 per cent instead of the 33 1/3 per cent so authorized.

"3. That the freight rates and charges herein determined will enable the carriers in the respective rate groups, under honest, efficient, and economical management and reasonable expenditures for maintenance of way, structures, and equipment, to earn an aggregate annual net railway operating income equal, as nearly as may be, to a return of 5.75 per cent upon the aggregate value, as taken for the purposes of this proceeding, of the railway property of such carriers held for and used in the service of transportation."

In commenting on iron, steel and ore rates specifically, the commission states: "We feel warranted in taking notice of the fact that since this case was submitted the general condition of the iron and steel industry has materially improved." Continuing:

"Transportation charges on the different raw materials are of varying importance to the different manufacturers. Manifestly changes in rates on one raw material unaccompanied by like changes on others tend to cause dislocation of relative production costs. A number of readjustments resulting in reductions of rates on raw materials and finished products have been made by the carriers since 1920. The reductions were not applied uniformly upon all the raw materials, and have resulted in complaints of unjust discrimination and undue prejudice. Except in particular situations, or to the extent that rates on one or more raw materials are from a transportation standpoint too high as compared with rates on others, it would appear that reductions in rates on the raw materials should, in so far as possible, be made upon all alike.

"There has been some improvement since the autumn of 1921, but, until overstocked markets shall have further readjusted themselves, the volume of movement can hardly be materially increased by establishment of any ore and smelter-product rates which would be fairly compensatory to the carriers."

Ore Rate Issue Is Only Partly Settled

CLEVELAND, May 29.—Uncertainty still exists as to how the interstate commerce commission's rate decision applies to shipments of Lake Superior iron ore. The shippers' first impression was that the decision does not affect the rates from the mines to upper lake ports, as those rates were not increased Aug. 26, 1920. They were advised by counsel that no change has been made in the upper lake rates, and later they received a report from a semi-official source tending to support their conclusions. Some of the ore companies' legal advisors, however, believe that the phraseology of the decision is such that it could be made to apply to those rates. They say a great deal depends on how the railroad executives wish to construe. If the executives file new tariffs reducing the rates 10 per cent, it is believed the commission will be acting within the scope of the decision if it approves the tariffs. This point remains to be clarified, and the intentions of the railroad companies probably will be disclosed in a few days.

Ore shippers generally are surprised and disappointed by the decrease. They have been contending for more than a year in the Adriatic Mining Co. rate case for a reduction of 20 to 25 per cent; and have submitted evidence to show that those rates were "inflated" out of all proportion to others during the war.

The decision is interpreted as applying to ore rates from lower lake ports to furnaces, though shippers also see possibilities for complications in this direction, due to the fact that the Buffalo furnace companies have a case pending before the commission to prohibit the carriers from reducing ore rates. It is assumed that the railroads will withdraw the ore tariffs which caused the Buffalo furnaces to protest.

Shippers and railroad executives have conferred informally in an effort to reach a basis of understanding. The ore coal and coke committee of the Central Freight association, representing the railroads, listened to arguments from ore shippers at a meeting in Pittsburgh, and agreed to recommend that the rates be put in effect before July 1. Ore shippers are endeavoring to have the new ex-lake rates made appliable June. 5.

Rates on Ore, Lower Ports to Furnaces

Lake Erie ports to—	Aug. 26, 1920	Rates prior to 40 per cent advance: Present rates	New rates
Valleys	$0.65	$0.91	$0.82
Dover	.70	.98	.88
Midland	.79	1.105	.995
Pittsburgh	.91	1.275	1.145
Jackson (Toledo)	.715	1.00	.90
Jackson (Cleveland)	.89	1.245	1.12
Ironton, Hamilton	.99	1.385	1.245
Johnstown	1.03	1.44	1.30
Lehigh Valley	1.54	2.155	1.94
Sparrows Point	1.59	2.225	2.005

Note—The interstate commerce commission's decision puts the new rates at 26 per cent over those in effect prior to Aug. 26, 1920. This is not equivalent to a flat reduction of 10 per cent from the present rates. The above "new rates" are figured in accordance with the commission's decision, and following the commission's rule for the disposition of fractions. They are exact rates for the line hauls.

Sells Caucasian Ore

The Iron & Ore Corp., 11 Broadway, New York, of which Paul G. Leone is managing director has been appointed exclusive agent in the United States for Caucasian manganese ore to be shipped by an association of manganese ore mines in the Caucasus which has monopoly from the Georgian government for exporting Caucasian manganese ore. The Iron & Ore Corp. has sold during the past few weeks, from 20,000 to 25,000 tons of this manganese ore for early shipment to this country.

President Lauds Work of Unemployment Body

President Harding has written a letter to Secretary Hoover in which he expresses his appreciation of the results achieved in reducing unemployment through the work of the unemployment conference and its standing committee. He states:

"Now that the revival of employment through the country—except for the strikes—has so greatly improved our situation that our anxieties in this particular are largely removed, I wish to extend my gratitude to every one of the great body of our citizens who gave such efficient service in the organizations set up and co-ordinated under the unemployment conference of last autumn. The conference members and its standing committees deserve great credit for the successful inauguration and stimulation of the great simultaneous movement in the community, and its continuing organization, which has so greatly succeeded in the mitigation of what otherwise would have been great suffering.

"We have passed the winter of the greatest unemployment in the history of our country. Through the fine co-ordination and co-operation among federal and state officials, mayors and their committees of employers, relief organizations and citizens, we have come through with much less suffering than in previous years, when unemployment was very much less. So much has this been the case that except for the intensification of public works by the federal, state and municipal governments, the demand for aid to the unemployed from the federal treasury disappeared in the country. Only two or three of our larger cities failed to secure co-operation to the best advantage."

Extend Alien Restriction

Washington, May 23.—Nothing is contemplated at this session, but early in the next session hearings probably will be held by the house and senate immigration committees looking forward to complete revision of immigration legislation. The President has signed the resolution extending the 3 per cent restriction until June 30, 1924.

Honor Tin Plate Works

The N. & G. Taylor Co., Philadelphia, manufacturer of tin plate, now in its 113th year, was represented at the luncheon given by the Philadelphia chamber of commerce to the Association of Centenary Firms and Corporations at Philadelphia May 29. The companies represented were all over 100 years old, having done business before the days of coal, gas, railroads and electricity and some long before the days of steam or banks and even before there was a state of Pennsylvania.

Other companies in the association include Horace T. Potts & Co., R. D. Wood & Co., William & Harvey Rowland, Inc., H. W. Butterworth & Sons Co., Smith & Furbush Machine Co., Nathan Trotter & Co., Job T. Pugh, Inc., and Edward K. Tryon Co.

Pipe Plant Is Trying New Co-operative Plan

Birmingham, Ala., May 29.—A board of operatives which will in effect have charge of the operations of the plant of the American Cast Iron Pipe Co., here is announced in new plans for the industry. This board will co-operate with the board of management named by the directors and the two will work together to promote harmony between the company and its employes.

Ralph R. Silver, who is at the head of some of the welfare work, is chairman of the board of operatives. This board will name two of their members to be directors of the company. A statement from the company says:

"The board of operatives is expected to provide a channel to secure and insure close relations and intelligent co-operation. The board will have access to the books of the company and will be made familiar with its monthly, quarterly and yearly statement of earnings. It will be consulted by the board of management on questions affecting the employes, including any important changes in wages, hours of work or working conditions. It will be expected to make recommendations to the board of management on such matters affecting the employes as it may desire."

The company is capitalized at $2,000,000 and employs approximately 1200 men. John J. Egan is president.

Amalgamated Mills Begin Wage Conferences

Representatives of the Western Sheet and Tin Plate Manufacturers' association and the Amalgamated Association of Iron, Steel and Tin Workers were to begin their annual wage conference in Atlantic City, May 29. The conference of the Western Bar Iron association with the representatives of the Amalgamated association is to start in Atlantic City, June 5. The wage agreements which the manufacturers have with the Amalgamated expire June 30. Heaters and helpers in the tin mills are asking for a 5 per cent advance above the base rate, this being the only change suggested in the sheet and tin plate scale. Puddlers are asking for an advance in the rate for boiling amounting to about $1 per ton.

Renews Lockout Parleys Over Rights

London, May 18.—As a result of the findings of the court inquiry headed by Sir William W. Mackenzie, the employers and unions concerned in the engineering lockout over the managerial rights issue resumed conferences on May 16. The court under the law has no power other than moral suasion to enforce decisions. The real settlement of the dispute therefore depends on the conference, although the findings of the court offer a new basis for discussion. Meanwhile a local settlement has been reached in the Birmingham area.

Niagara Falls Bridges To Be Improved

Great changes will be made in the bridges across the river at Niagara Falls. A complete new structure will be built between the present cantilever bridge and the one used by the Grand Trunk railway and for pedestrian traffic. The lower bridge will be greatly extended and widened to 100 feet. The upper deck will carry four railroad tracks instead of two, as at present, and the lower deck will carry a double track trolley line through the central portion with a wide roadway for vehicle traffic on each side. Outside the bridge structure at the level of the lower deck will be sidewalks for foot traffic.

Numerous Bridge Jobs Up

Four bridges are to be erected over the Morava river at Chuprija, Markovac, Chachak and Glogovac, all in Jugo-Slavia. In addition the new 1200-mile railroad which an American syndicate is constructing to link Belgrade, the capital, with the seaports of Cattaro and Spalato on the Adriatic, will require several bridges. One of these will cross the Danube river near Prahovo, on a line which will connect with the Roumanian railroad to Bucharest. Another will bridge the Danube for a line connecting Pancevo with Belgrade and then to Mosovsha Mitrovitza in South Serbia. Another railroad which will connect Palanka with Sopotkik will necessitate bridges over the Sava and Danube rivers. Domestic interests in the kingdom are engaged in a line from Tital to Orlovat which will bridge the Tisa river. A Jugo-Slavian government commission is being sent to Vienna to order the material for the bridges over the Morava.

Let Business Be Studied

(*Concluded from Page* 1545)

the possibility of demoralization and disaster as the result of the military cataclysm which for four years and more convulsed the world. We have not, I think, entirely passed from under the clouds of adversity. Certainly we are carrying hitherto unheard of heavy governmental financial burdens. At best, these will not soon be fully discharged. To bear them gracefully and contentedly there must be not only forbearance, encouragement and assistance from every department of government up to the limit of propriety and justice, but there must also be entertained by every individual, consistently and constantly, a spirit of patience, pluck, energy, generosity, loyalty and charity fully up to his or her highest intelligence.

We must do our part. We must be fair and just, as loyal to the government as we were during the war. We must treat others in such manner as to be entitled to their approval.

General Public Is Just

Little need be said about the changed and changing business conditions for the better in the iron and steel industry. The facts and figures have been and are being published. The volume is large and increasing. The profits are not satisfactory but few, if any, ought to be doing business at a loss, and we shall, soon I hope, settle down to a readjusted basis of prices and rates that is fair and reasonable and on a comparative parity. Let us be moderate in our demands. Profiteering will be more and more exposed and eliminated. I could if necessary refer to some outrages that still exist; but the general public, when correctly informed, is disposed to be just and it will not long overlook nor condone the exceptional glaring injustices that still obtain in prices and rates.

Ever since the armistice was signed, when I have spoken it has been hopefully as to the long business future. I am still an optimist, and likewise are you. Big, even profitable, business has been ahead of us all these years, though it has been at times obscured. Now we seem to be nearer a realization. But every one in official or private life, employers and workmen, professionalists, merchants, financiers, mechanics, artisans, all, properly supported by our government, may and will, as never before, utilize to the greatest advantage of our own people and others the existing and productive wealth of this great country.

Optimism arises from opening one's eyes and ears and mind to the good things in life which a merciful and overruling Providence has bestowed. May all of us have sense to appreciate. Pity the chronic blind, deaf and foolish pessimist of the United States.

Iron and Steel Imports of Japan Decrease

Japan imported 1,412,881 gross tons of iron and steel last year as compared with 2,046,247 tons in 1920, according to a compilation of statistics by the iron and steel division of the American department of commerce. The 1921 tonnage is only 69 per cent of that in 1920.

The greatest losses from the 1920 tonnage were: Plates and sheets, not coated, 152,459 tons; bars, rods, angles, etc., 145,325 tons; pig iron, 119,173 tons; iron ore 82,658 tons; rails, 58,478 tons; scrap iron and steel, 29,978 tons; wire rods, 22,038 tons. These products, furthermore, show a decrease from the 1919 figures. The only increase of considerable size was in materials for construction of buildings, bridges, vessels, docks, etc., imports of which grew from 3476 tons in 1920 to 20,767 tons in 1921. Unusual activity in steel frame office building construction in Tokio was responsible for this advance.

The United States' share in the Japanese steel market during 1921 was 362,670 tons. Deducting iron ore and pig iron, which are almost entirely taken from China, Manchuria, Chosen, and India, the United States supplied 43 per cent of Japan's takings. American exports of iron and steel to Japan in 1921 were:

Steel sheets	127,623
Structurals	49,827
Steel rails	42,239
Steel plates	31,037
Tin plates	30,076
Wrought pipe	29,226
Steel bars	23,869
Plain wire	6,920
Wire rods	6,258
Wire nails	5,307
Cast iron pipe	2,802
Hoops and bands	2,233
Iron sheets and plates	2,169
Galvanized sheets and plates	1,305
Bar iron	641
Bolts, nuts and rivets	617
Railroad spikes	526
Ship and tank plates	440
Nails, not wire or cut	228
Ingots, blooms and billets	200
Pig iron	102
Barbed wire	15
Cut nails	10
Total	362,670

The Hampden Grinding Wheel Co., Springfield, Mass., has acquired the property and business of the Hampden Corundum Wheel Co., of that city. Willard P. Leshure, president of the latter company, also heads the new company.

Fuel and Iron Has Loss in First Quarter

The Colorado Fuel & Iron Co., Denver, Col., for the first quarter of 1922 reports a deficit of $431,268 against a surplus of $134,898 in the corresponding period last year. The detailed statement of income and expenses for the period compared with that for last year follow:

	1922	1921
Gross receipts	$6,575,661	$10,028,742
Operating expenses	5,979,417	8,931,644
Net earnings	$ 596,243	$ 1,097,098
Income from other sources	64,805	99,996
	$ 661,049	$ 1,197,094
Fixed charges, bond interest, taxes, sinking fund, etc.	716,306	691,567
Income above fixed charges	.....	$ 505,527
Deficit	$ 55,257	.....
Depreciation	376,011	370,629
Deficit	$ 431,268	.....
Surplus	.....	$ 134,898

Receivers for Auto Plant Are Appointed

Harry G. Fisk, Springfield, Mass., and Frank H. Shaw, Chicago, have been appointed receivers for the Stevens-Duryea Co., Chicopee, Falls, Mass., builders of automobiles, in bonds of $35,000 each. Application for the appointment of receivers was made by the Fisk Tire Co., Inc., which alleges the company owes $1,100,000 and has assets of $4,124,471, but not sufficient money to carry on the business. Ray S. Dearing, president of the company, says it is not insolvent. The receivers will continue the business.

Bank Asks for Receiver

Petition for a receiver of the Toledo Tap & Die Co., Toledo O. has been filed at the common pleas court in that city a banking institution. Foreclosure of the equity of Roberts L. Ellery, president, and sale of the property, is asked. A Chicago company recently obtained a judgment of $14,800 against the company and other creditors are threatening court action, it is alleged in the petition. The Toledo banking house asks judgment of $15,000.

Ore Company Chartered

The Clement K. Quinn Ore Co. of Duluth, has been incorporated in Minnesota with an authorized capital of $1,000,000, and a debt limit of $2,000,000. The charter authorizes the company to mine, smelt and refine iron and copper ores in Minnesota and Michigan. It is the operating subsidiary of Clement K. Quinn & Co.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

FRANCIS JORDAN HALL resigned May 31 as vice president of the Central Iron & Steel Co., Harrisburg, Pa., to become a vice president of the Commonwealth Trust Co. of that city. When Mr. Hall severed his connection with the Central company he terminated nearly 20 years continuous association in the iron and steel industry, all of which was with the Central company except for the period during the war when Mr. Hall was active as a member of the American Iron and Steel institute's subcommittee on steel distribution. He was associated with James B. Bonner, vice chairman of the committee and actively in charge at Washington, and looked after plate production in accord with allocations of the war industries board through its steel division and the subcommittee. Mr. Hall participated in the price fixing conferences of the board and the industry and largely was responsible for elimination of the Chicago base on plates at that time. He was born in Harrisburg April 1, 1878, and was graduated from Princeton university in 1902. In December that year he started as a laborer with the Central Iron & Steel Co. and worked his way up to be general sales agent in 1908. On June 1, 1917, following termination of a receivership which had control of the company for five years, Mr. Hall was elected vice president. L. D. Perry, treasurer of the Central Iron & Steel Co., Harrisburg, also resigned a short time ago, to devote his attention to other interests. Mr. Perry in 1913 went to the Central Iron & Steel Co. as comptroller for receivers and served as a member of the operating committee until the termination of the receivership in 1917. For the past five years he has been secretary and treasurer of the company and has handled the affairs of its subsidiary, the Connellsville Basin Coke Co., with mines and ovens in West Virginia.

Edward J. Bullock, director of purchases of the Standard Oil Co. of Indiana, has been elected a member of the board of directors.

Paul G. Leone, managing director of the Iron & Ore Corp., 11 Broadway, New York, will leave June 1 on a two months' trip to Europe.

William Dette, partner in Crocker Bros., New York, sailed recently for a three months' trip to Europe.

Thomas L. Chadbourne, the outstanding legal figure in the proposed merger of several independent steel companies, has been elected a director of the Burns Bros. Coal Co.

John Sincock, general superintendent

FRANCIS JORDAN HALL

of W. J. Rainey, Inc., retains his own title and assumes the additional duties at Connellsville, Pa., of L. L. Willard, vice president, who resigned on account of ill health.

George W. Scott, who resigned recently as manager of the by-products department of the United Alloy Steel Corp., Canton, O., has joined the sales force of the Sheet Metal Mfg. Co., Youngstown.

William H. Woodin, president of the American Car & Foundry Co. has returned to the United States after attending the International Railways conference at Rome. Mr. Woodin recently was elected a director of the American Ship & Commerce Corp.

B. L. Winchell, formerly president of the Chicago, Rock Island & Pacific and the St. Louis & San Francisco railroads, has been elected president of the Remington Typewriter Co. and Frank N. Kondolk, president, has been made chairman of the board.

Elwood Haynes, president of the Haynes Stellite Co., Kokomo, Ind., is to receive the John Scott medal, a certificate and premium for his discoveries in stainless steel, stellite and chrome iron, at the commencement exercises at the Worcester Polytechnic institute, Worcester, Mass., June 2.

Paul H. Peterson has been placed in charge of the foreign department of Joseph T. Ryerson & Son which has been moved to New York from Chicago. H. B. Kraut, formerly in charge of the department, will act as technical manager of the machinery department.

John L. Hibbard, formerly sales manager of the Studebaker Corp. and more recently president and managing director of the Cleveland Tractor Co. of Canada, Ltd., has been elected president and general manager of the Maxwell Motor Co. of Canada, Ltd., and the Chalmers Motor Co. of Canada, Ltd., in charge of operations of both companies.

Geter C. Shidle, formerly Pittsburgh district manager of the LaBelle Iron Works, Steubenville, O., will assume duties June 1 of sales manager of the iron and steel department of the Thomas R. Heyward Co., with offices in the Bowman building, Pittsburgh. Mr. Shidle succeeds William M. Orr who left the Heyward firm March 1.

George C. W. Klippel, assistant treasurer of the Elyria Iron & Steel Co., has been elected president of the Cleveland Association of Credit Men, Cleveland. Others elected include H. V. Reed of the Root & McBride Co., and Heber Outland of the Cleveland Metal Products Co., T. L. Philpott of the Betz-Pierce Co., E. M. Spelman of the Guide Motor Lamp Mfg. Co., and J. D. Cathon of the Hoover Suction Sweeper Co., all as members of the board of directors.

Charles F. Jackson, for several years connected with the office of the

consulting engineer M. A. Hanna & Co., Cleveland, in charge of the mining engineering department, became associated with the firm of Crowell & Murray, Cleveland, as mining engineer recently.

Samuel Mather of Pickands, Mather & Co., Cleveland, has returned form a four months' trip to Europe.

J. F. Motz, formerly Pittsburgh manager of the Electric Controller & Mfg. Co., has joined the sales and engineering staff of the Factory Products Co., Inc., 204 Oliver building, Pittsburgh.

W. B. Peirce, for 12 years superintendent of the Buffalo Bolt Co., North Tonawanda, N. Y., and for the past two years connected with the Peirce-Brown Co., that city, has been made works manager of the Graham Bolt & Nut Co., Pittsburgh. Mr. Peirce took up his new duties June 1.

Frank Phalen has resigned after 16 years as New York district sales agent of the Republic Iron & Steel Co. to associate himself with his brother, Charles G. Phalen, as Phalen & Co., Inc. The company has headquarters at 342 Madison avenue, New York, and is acting as sales agents in the New York territory for manufacturers of railroad equipment, specialties, etc.

A. L. Humphrey, president of the Westinghouse Air Brake Co., Wilmerding, Pa., has been elected third vice president of the Pittsburgh Chamber of Commerce. Other vice presidents elected were William T. Todd, treasurer and director of Somers, Fitler & Todd Co., Pittsburgh, machine tools, supplies, etc., and Harry C. Graham, president of the Graham Bolt & Nut Co., Pittsburgh. W. S. Linderman, vice president and director of the Duquesne National bank, Pittsburgh, and director of the Neely Nut & Bolt Co., that city, was chosen treasurer.

Lorenzo C. Dilks has resigned as vice president of the George A. Fuller Co., New York, and is planning to again identify himself with the steel industry with which prior to the war he had been connected in a prominent way, especially with the fabricating branch of the business in the eastern territory. Before his affiliation with the George A. Fuller organization, and one of its affiliated enterprises, the Carolina Shipbuilding Corp., Wilmington, N. C. during the war, Mr. Dilks was president of Milliken Bros. Inc., Staten Island, New York, and before that vice president and general sales manager of the Eastern Steel Co., Pottsville, Pa. His present address is in care of the George C. Moon Co., 124 White street, New York.

Obituaries

JOHN MONROE LONGYEAR, one of the most prominent and successful figures in the history of the Lake Superior iron ore district, died in Brookline, Mass., May 28. He retired from the active management of his interests in the Lake Superior district about 15 years ago, although maintaining an office at Marquette, Mich. More recently he became interested in coal and other mining projects, and several years ago was head of the Arctic Coal Co., with headquarters in Boston. This company promoted a coal mining project in Spitzbergen, but Mr. Longyear withdrew some time before his death. He was over 70 years old. Mr. Longyear became interested in the mining of iron ore in the Lake Superior district 35 or 40 years ago. He went into the woods of the upper peninsula of Michigan as a representative of a lumber company, and after spending several years in that district became impressed with the possibilities in prospecting for iron ore. He obtained control of immense tracts on the Marquette, Menominee and Gogebic ranges in Michigan and also some areas in Minnesota. He formed the partnership of Longyear & Bennett which was prominently identified with the history of the Lake Superior mining region. In 1906 Mr. Longyear leased most of his iron ore properties in the two states to the United States Steel Corp. He was a multi-millionaire, one of the wealthiest men to have acquired fortunes in the Lake Superior ore district.

Patrick Doyle, 62 years old, treasurer of the Worcester Brass Co., Worcester, Mass., which he founded in 1896, was accidentally asphyxiated by gas at his home, May 23. He leaves two sons, James P. Doyle and William T. Doyle, president and secretary, respectively, of the company.

Benjamin Hiel Bristol, 83 years old, former president of the Bristol Mfg. Co., Bristol, Conn., and inventors of electrical, steam and water meters, died at his home in Platts Mills, Waterbury, Conn., May 24.

F. J. Town, who has been in charge of the malleable foundry of the Pittsburgh Valve & Fittings Co., at Barberton, O., for 16 years, died recently at his home in Barberton. He went there in June, 1906, to assume full charge of the construction and supervision of the malleable foundry at the Pittsburgh Valve plant. He was head of the department until his death. Prior to joining the Pittsburgh Valve company he was superintendent of the Buckeye Malleable Iron & Coupler Co., Columbus, O., for 19 years. He was born in Cleveland June 7, 1853.

Ernest Solvay, one of the originators of the Solvay process for manufacturing soda, died suddenly at his home in Brussels, Belgium, May 26, aged 84 years. With his brother Alfred, he was co-inventor of all the basic processes used by the Solvay Process Co. in its Syracuse, N. Y., and other plants, and in collaboration with M. Semet, of all those used by the Semet-Solvay Co. During the war he took a prominent part in Belgian relief work, and served three months' imprisonment for insulting a German officer. Born in 1839, the son of a refiner of salt, Mr. Solvay's early associations were closely bound with one of the principal raw materials used in his process. Experience was also to be gained later when at the age of 20 he was appointed assistant to his uncle who was manager of a gas works. One of his tasks was to find some application of gas liquor, which consists largely of ammonia and ammonium salts, and two years later, assisted by his brother Alfred, he originated a method for the manufacture of soda ash by the reaction of ammonium bi-carbonate on salt brine. While his early experiences were threatened with commercial failure, he continued his efforts unceasingly and in 1872 succeeded in interesting Ludwig Mond. A plant was erected by Messrs. Brummer, Mond & Co., near Norwich, which later became famous as the largest alkali works in the world and from about this time may be said to date the complete commercial success of the Solvay process by which probably 95 per cent of all the soda ash is now manufactured. His principal Belgian works is styled the Solvay Society of Brussels. He founded the Institute of Chemistry and was president of the Bureau of International Institute, Brussels, and an honorary member of the Royal Institute of Great Britain. At one time, he was a member of the Belgian senate, and on his seventy-fifth birthday was appointed by King Albert a grand officer of the Order of Leopold.

Northwest Steel Demand Gains

Greater Activity in Construction Work, Logging Industry and Public Improvements Creating Need for Material—Japan Heavy Buyer of Steel Scrap—Wholesalers' Business Increasing—Metal Trades Association Meets

Special Correspondence

SEATTLE, May 26.—Continued improvement is noted in industrial and business enterprises of the Pacific Northwest. In some lines the gain is slow, but everywhere there is a better demand. Great activity in logging and lumbering, a better demand for steel products, decreased unemployment, brisk shipping and a good volume of export trade are the outstanding features of the situation. Extensive public improvements and the investment of much private capital in industrial, business and residence buildings is reported.

In the recent municipal election in Seattle a proposal for a steel bridge to cost $750,000 was lost by a narrow margin. However, this city gave emphatic disapproval to a socialistic plan to place the expense of the municipal street railway onto general taxation. This would have brought about an increase of 20 per cent in taxes. Until this matter was settled much proposed building was deferred. Now, it is announced 15 construction enterprises, involving an expenditure of $3,500,000, will be undertaken this year. These include seven apartment buildings, several factory and industrial plants, and a new business block to cost $1,150,000.

The call for labor is increasing, and in some lines skilled labor is insufficient for the demands. The demand is largely for farm and dairy labor.

The lumber mills are rushed with work and many of the larger plants are adding a second shift. In some instances mills are behind in deliveries, which affects the freight situation. For the first time in months new orders placed with Washington and Oregon mills during one week in April exceeded production, by 22 per cent. In the same week 130 mills cut 79,567,310 feet sold 97,198,575 feet and shipped 86,273,275 feet. While the lumber demand from Japan shows a decrease, a large volume of shipments are being made by water to the Atlantic seaboard and there is a better demand from the interior markets. Business with Australia and South Africa also has improved

Shipping is active, especially on the intercoastal route where recent readjustments of freights have given the water lines a continued advantage over their rail competitors. On the Oriental route a freight war is still in progress and lumber is being carried to Japan for $10 or less.

Although 2500 union coal miners are on strike in this state, fuel supplies are so large in the Puget Sound district that British Columbia producers are complaining of the lack of a market. Importers of Japanese and Australian coal have found no encouragement here. The only effect of the strike has been to cut off local sources of coke supply.

Not much steel is passing through Pacific terminals for shipment to the Orient. However, the movement of shipyard materials and scrap steel to Japan has been exceptionally active, and there is still considerable cargo to be shipped. The freight on scrap steel to Japanese ports is $4 to $5.

Plan Logging Railroad

Among the extensive improvements planned for the immediate future is a new logging railroad, standard gage, 12 miles long, to be built into a new section of timber north of Hoquiam.

While shipyard activity has been confined to routine repair and drydock jobs, there is a better tone in this industry. Todd Dry Docks, Inc., Seattle recently completed a $125,000 repair job on the British steamship NARENTA in nine days less than contract time. This yard has just added a fifth pontoon to its 12,000 ton floating drydock, giving it a capacity of 15,000 tons, capable of lifting the largest ships in the Pacific.

The Alaska Steamship Co. has asked for bids for a combined freight and passenger vessel designed for the Alaska routes. This ship is to be 340 feet in length, with a beam of 45 feet. It is to have accommodations for 216 first class passengers and 2000 tons of cargo. Figures are asked for both steam and motor power and coast yards are now making estimates. This company last year had the motorship KENNECOTT built by the Todd Dry Dock & Construction Corp., Tacoma, and its remarkable success in the intercoastal trade has brought favorable attention to ships of this type.

Recent reorganization of the Todd companies resulted in the election of C. W. Wiley to the chairmanship of the boards. He was president of both companies. Mr. Wiley will act as personal representative on this coast of W. H. Todd. H. W. Kent who was vice-president, has been elected to succeed Mr. Wiley as president of the Seattle company while J. A. Eves has been elected president of the Tacoma corporation.

Sixty delegates attended the sixteenth annual convention at Seattle last week of the United States Metal Trades Association of the Pacific Coast. The new officers elected are: President, A. G. Labbe, Portland; first vice president, F. G. Frink, Seattle; second vice-president, John Hartman, Tacoma; third vice-president, J. M. Fitzpatrick, Spokane; treasurer, F. H. Lamb, Hoquiam; secretary, John B. Jones, Portland. This organization includes Washington, Oregon and the northern part of Idaho. The reports submitted indicated that machine shops, foundries and plants manufacturing mill and logging machinery are getting the benefit of the revival in lumbering and general industry.

Wholesalers in this district report business well maintained. The volume is increasing, although buying is limited to small tonnages. With the opening of spring work, the demand in eastern Washington and eastern Oregon is much more active and a good business is expected in the agricultural section of the two states throughout the remainder of the year.

Since a week ago wholesalers have advanced prices on nails, plates, hoops and rivets, while there has been a slight cut in track spikes. These changes are in line with higher quotations at the mills and readjusted water freights. At Seattle, Tacoma and Portland, nails have been advanced 15 cents per 100 pounds hoops, 25 cents and plates, including universal plate 10 cents. Rivets have been increased 10 cents making the new price on cone rivets 4.70c and on button heads 4.60c. Because of cheaper water rates track spikes declined 25 cents, the new price being 4.00c.

The port of Grays Harbor has purchased from the Western Railway Supply Co., of Portland, 6900 lineal feet of steel rails on a bid of $7378.

Furnace Linings

Feature Orders of Refractory Market —Ohio User Takes 350,000 Brick

Pittsburgh, May 29.—Orders for blast furnace linings, complete or partial, have featured the refractory market during May. One large producer recently has entered 12 or 15 orders, some of which have already been shipped. These involve up to 250,000 brick each and one for an Ohio steel company's blast furnace calls for 350,000 brick. These buyers are located in every section of this country and some in Canada, indicating that blast furnaces everywhere are being put into readiness for resumption after coke supplies are available. The list includes such buyers as the Weirton Steel Co., Bethlehem Steel Co., the Wheeling Steel Corp., Otis Steel Co., Pittsburgh Crucible Steel Co., Sloss-Sheffield Steel & Iron Co., and others asking for immediate shipment. Numerous orders for complete or partial linings are on the books of brickmakers awaiting actual specifications. Open-hearth brick too have been in demand; orders coming to representative sellers are of fair size and comparatively numerous although during the past week some little let-up has been noted.

Prices are stiffening, there being less inclination to offer concessions due mostly to advancing costs of production attributed to the higher prices being paid for coal. Some makers already have advanced certain grades of ladle brick $2 per thousand. The quotable spreads, however, remain unchanged on fire clay, and Pennsylvania silica brick is strong at $30. One or two makers which have been quoting $28 on silica have brought themselves into line at the $30 level and this now is the minimum. Higher levels too are talked of in other grades.

Demand for magnesite and chrome brick continues to be reflected in numerous inquiries for one, two or three cars at a time, some calling for 10,000 to 35,000 brick each. A fairly large number of orders are placed from time to time for similar quantities of both grades. Magnesite is firm at present at $53, seaboard base, although an advance of $5 or $8 per net ton is contemplated when the tariff is applied. While $40 still is available on chrome brick in certain instances, $42 net is becoming the more general quotation, so much so that it soon will be the bottom of the market; a $45 price already is talked of. One producer recently has taken orders aggregating 150,000 chrome brick, typical orders calling for 20,000, 25,000 and 35,000 brick at a time. This company practically is filled up for two months and will not quote for extended delivery except on the basis of price levels prevailing at time of delivery or a flat price of $45. A few inquiries now are current involving 25,000 to 35,000 chrome brick and a few for 10,000 to 15,000 magnesite brick are out. A recent purchaser of chrome brick was the Trumbull Steel Co.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$32.00 to 35.00
Pennsylvania, No. 2	28.00 to 32.00
Ohio, No. 1	32.00 to 35.00
Ohio, No. 2	28.00 to 32.00
Illinois, No. 1	32.00 to 35.00
Illinois, No. 2	30.00 to 35.00
Kentucky, No. 1	32.00 to 35.00
Kentucky, No. 2	30.00 to 32.00
Missouri, No. 1	35.00 to 42.00
Missouri, No. 2	28.00 to 33.00
Maryland, No. 1	32.00 to 40.00
Maryland, No. 2	27.00 to 30.00

SILICA BRICK

Pennsylvania	$30.00
Chicago	35.00 to 38.00
Birmingham	40.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$53.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$40.00 to 42.00

Occupational Ore Tax Is Held Valid

Duluth, Minn., May 29.—The Minnesota state occupational tax on iron ore mines has been declared valid in a decision by Judge Johnson in the United States district court at St. Paul. The court ruled against the mine operators on all of their three contentions, that the tax is a burden on interstate commerce, that it is not levied uniformly, and that it is not an occupational but a property tax, representing double taxation.

Thirty mining companies, including the Oliver Iron Mining Co. are interested in the case. A temporary injunction against the state will remain in force pending an appeal to a higher court. The taxes involved under the law are estimated to amount to $1,000,000 annually.

Hydraulic Sells Plant

The Hydraulic Steel Co., Cleveland, has disposed of the plant of its subsidiary the Canton Sheet Steel Co., to the United Alloy Steel Corp., of Canton. The details of the terms of the sale have not been made public but it is understood that the Hydraulic company has placed itself in strong financial position by virtue of the sale. The Canton plant was purchased five years ago. It consists of four open hearth furnaces, a blooming mill, a sheet bar mill and 10 sheet mills. The rated annual capacity is 150,000 tons of ingots and 124,000 tons of sheets. The acquisition will increase the number of sheet mills of the United Alloy Steel Corp. to 33.

Prices Higher

On Benzol, Toluol and Solvent Naptha Trading Lighter

New York, May 29.—Due primarily to the steady increase in motor fuel prices, the market on light oil distillates has advanced. The increase comes at a time when demand for benzol and toluol, while of a substantial character is lighter than a fortnight or so ago. Demand for refined benzol is estimated at 60 per cent normal. The new price schedule effective June 1, follows: Pure benzol in tanks, 30 to 33 cents, f.o.b. works, in drums, 35 to 38 cents; 90 per cent benzol, in tanks, 27 to 29 cents, and in drums, 32 to 34 cents; toluol in tanks, 30 to 33 cents, and in drums, 35 to 38 cents; and solvent naphtha in tanks, 27 to 29 cents, and 32 to 34 cents. Trading in this latter description is light. A special solvent, xylol, is being quoted at 29 to 32 cents in tanks and 35 to 37 cents in drums.

The situation in naphthalene continues quiet, with prices unchanged at 7 to 8 cents, f.o.b. works on flakes, and 8 to 9 cents on balls. Phenol also is moving slowly and is being quoted at 12 cents, government warehouse, this being synthetic phenol, and 15 cents producers' plants, for the fresh phenol. Sulphate of ammonia is being produced at around 65 per cent capacity, with prices steady at $2.65 to $2.70, f.o.b. works, on domestic business, and $3.15 to $3.25 on foreign. This steadiness is attributable more to the sold-up condition of sellers and the prospects of early seasonal buying rather than to any amount of new business at the moment.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30 to $0.33
Toluol	.30 to .33
Solvent naphtha	.27 to .29

Per Pound at Producers' Plants

Phenol	$0.15
Naphthalene, flake	.07 to .08
Naphthalene, balls	.08 to .09

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$2.65 to $2.70

(Prices on spot sulphate also quotable on business for delivery over next several months.)

Contract

Pure benzol	$0.27 to $0.29
Toluol	.28 to .30
Solvent naphtha	.25

Per Pound at Producers' Plants

Phenol	nominal
Naphthalene, flake	$0.07 to $0.08
Naphthalene, balls	.08 to .09

Per 100 Pounds at Producers' Plants

Sulphate of ammonia (12 months)	nominal

May Tool Purchases Numerous

Enlarged Plant Operations Are Reflected in Numerous Orders and Inquiries—Prospective Machinery Demand Is Encouraging—Dealers Expect Some Railroads To Buy Shortly—Improvement in Crane Demand Continues

CONSERVATIVE buying marked the demand for machine tools and shop equipment during May. However, dealers' sales books, with few exceptions, show the amount of equipment moved during the month was fully double that of April. Demand was principally for single tools, that is but one tool to a customer at a time, but orders were so numerous that the volume of business done was exceedingly satisfactory to dealers. While demand was practically confined to secondhand equipment, more orders for new tools were placed during the month than for some time preceding, and manufacturers feel that the return of business to them will be gradual from now on as general shop operations continue to increase.

Used Tool Stocks Being Liquidated

STOCKS of secondhand machinery are being rapidly liquidated and in view of the fact used tool prices are becoming more firm, it is only logical that more new tools will be purchased in the future, dealers state. Since demand has shown a quickening tendency, used machinery prices have become more stable and where formerly practically any price named would purchase a desired tool, today dealers are enjoying business to the extent where they can hold out for more nearly the original price which they ask.

Some Large Orders Were Placed

WHILE most orders placed during the month were for single tools quite a few placed called for more than one machine. Some of these included the purchase of $25,000 of equipment by the Winther Motors Co., Kenosha, Wis.; nine tools by the Cuba railroad, New York; $60,000 of general equipment by the Gulf & Ship Island railroad; 12 tools by the Western Maryland railroad and purchases by the General Electric Co., Schenectady, N. Y., the Jacksonville Terminal Co., Jacksonville, Fla., the Sugar Pine Co., San Francisco, the Wheeling Steel & Iron Co., Wheeling, W. Va., the Durant Motor Car Co., Oakland, Cal., and the Otis Elevator Co., New York.

Prospective Demand Is Large

PROSPECTIVE business is exceptionally good. During the month numerous inquiries were added to the long list current and while most of them were of the single tool variety, a number called for from five to a dozen machines. Railroad demand is exceptionally promising, according to dealers. Indications are that practically all the roads with inquiries in the market shortly will take action against them. These roads include the New York Central, the Santa Fe, the Lake Erie & Western, the Chicago, Burlington & Quincy, the Norfolk & Western, the Pennsylvania, the Illinois Central and the Erie. General industrial inquiry is also good and lists are either in the market or in process of preparation from the H. H. Franklin Mfg. Co., Syracuse, N. Y., the Whitaker-Glessner Co., Portsmouth, O., the Studebaker Corp., South Bend, Ind., the Cherry Tree Machine Co., Cherry Tree, Pa., the Acme Stamping & Mfg. Co., Pittsburgh, the Frick Co., Waynesboro, Pa., the Jones & Laughlin Steel Co., Pittsburgh, the Petersburg Farm Machine Co., Petersburg, Va., the Union Iron Works, Erie, Pa., the D. J. Murray Mfg. Co., Wausau, Wis., the Robert Dollar Co., San Francisco, and the Erie Metal Furniture Co., Erie, Pa.

Municipal and Educational Demand Promising

EDUCATIONAL and public service demand for machine tools is of interest to the trade at this time and during May considerable of such inquiry was in the market. On May 9, the Navy department, bureau of supplies, opened bids on 12 engine lathes, 12 grinders and various other tools to be installed on new battleships. The Pennsylvania western penitentiary during the month closed on an appreciable list of machinery for which it has been inquiring some time, while the Wheeling, W. Va., board of education purchased a number of tools. The Cleveland board of education during the month rejected all bids submitted on the inquiry which it issued some weeks ago and it is expected to issue a new and larger one within the next few days. Bids on the machine tool requirements of the Youngstown, O., school board were rejected. In addition to these the city of Boston is in the market for some equipment for its transit department, while the city of New York is preparing a large list for early issuance, of tools needed by its street cleaning department.

Plant Operations Gain Steadily

METALWORKING shop operations improved steadily during the month. The coal strike appeared to have little effect on operations in general, although it is thought existing operations would be larger were it possible for some shops to obtain desired delivery on supplies. Due to lack of coke many steel companies are pushing deliveries of their product further into the future and this is having an adverse effect on machine shop operations. Demand for steel bars from automotive interests is brisk and although in most cases these shops are working to capacity, they, in all probability, will not be able to keep up this rate of operation unless steel supplies are forthcoming.

Crane Demand Is Improving

IMPROVEMENT in demand for cranes and allied equipment reported in April, has continued throughout May. Some of the orders placed for this class of equipment were from the Lehigh Valley, the Delaware & Hudson and the Lackawanna railroads; the Pennsylvania Sugar Co., Philadelphia, the Wheeler Condenser & Engineering Co., Carteret, N. J., the United Fruit Co., the Worthington Pump & Machinery Corp., Harrison, N. J., the Minnesota Steel Co., the American Sheet & Tin Plate Co., Pittsburgh, the Lorain Steel Co., Johnstown, Pa., and the Union Iron Works, Erie, Pa. Inquiry for crane and allied equipment has been extremely active. Some of the inquiries in the market are from Okura & Co., New York, the Asiatic Petroleum Co., New York, Goodman & Wolfe, Terre Haute, Ind., the Pennsylvania railroad and the Otis Elevator Co., New York.

Equipment Demand Is Increasing

Large Machinery Orders Are Limited but Demand for Single Tools Is Voluminous—Inquiries Reflect Betterment in General Shop Operations—Crane and Foundry Equipment Orders Are Improving

ACTIVITY in machine tool and equipment demand continues to improve as shop operations are increased. From all sections of the country come reports of a heavier demand for equipment and while the majority of orders are for single tools, it is noticeable that in addition to the fact these orders are numerous, there is less quibbling over price, indicating users are, in many cases, in immediate need of the equipment. Sales of size have been limited to one or two companies, but these do not reflect the demand as well as the numerous small orders which have and are being placed. The General Electric Co., Schenectady, N. Y., has been a recent buyer of size.

Inquiry has been more active than orders. While, as with orders, the majority of inquiries have been for single tools, a number of them involve as many as 20 tools. In the East the General Electric Co. is inquiring for a sizable list, while a New York city interest during the past few days entered the market for from 30 to 35 tools. In New England several fairly large inquiries have come out recently while in the Middle West dealers are entertaining lists calling in one instance for 21 lathes and in another for 10 automatics. Railroad orders are not numerous and practically no action is being taken on the inquiries issued by a number of these interests some time ago. The Illinois Central railroad is the latest railroad to enter the market with a sizable list. It is understood the Studebaker Corp., South Bend, Ind., is starting to take action against some of its needs, especially in special machinery.

Probably the most outstanding development in the equipment market has been the revival of interest in cranes and allied equipment. In the Pittsburgh district orders have been quite numerous, while in the East, although orders have not been exceptionally large or numerous, they have been satisfactory to makers. Foundry equipment demand is steadily increasing.

More Interest Is Shown in Machinery Offerings

NEW YORK, May 29.—Further inquiries are being issued by the General Electric Co., Schenectady, N. Y. Within the past few days, more than 20 machine tools have been brought out and more lists are expected. The latest inquiry includes 12 grinders, two engine lathes, a milling machine, and several turret lathes and automatic screw machines. The equipment is for Schenectady and East Lynn, Mass. So far as can be learned, the machinery for Pittsfield, Mass., is pending. In addition to its recent purchases, reported last week, the General Electric Co. closed on 10 special drilling machines. Another company is now in the market for 30 to 35 machine tools and the board of education, Fifty-ninth street and Park avenue, closed bids June 1, on a list of six small machine tools.

Demand generally, continues to expand, although with the exception of the above mentioned lists, orders and inquiries for the most part are comprised of one or two machines. Railroad buying includes two drills by the Pennsylvania, with other orders for this railroad expected soon to follow. The Western Maryland is now understood to be out of the market, following its recent purchases, which were distributed among several sellers.

The J. J. McCabe Lathe & Machinery Corp., New York, has booked among recent orders, two double spindle lathes, one of which is for Manila.

Crane buying is comprised of a few orders, including an electric overhead crane for the proposed Baltimore repair shops of the Western Maryland railroad, the business going to the Niles-Bement-Pond Co., 111 Broadway. The Concrete Steel Co. placed a 7½-ton electric crane, with 70-foot span, and a 5-ton electric crane, with 90-foot span, for its plant in Camden, N. J., this order going to the Whiting Corp., Harvey, Ill. The Main Motor Haulage Co. has closed on a 10-ton caterpillar crane with 40-foot boom, equipped to handle a 1-yard clamshell bucket, to Northwest Engineering Co., Green Bay, Wis. The Stearns-Roger Mfg. Co., Denver, closed on a 12-ton locomotive crane to the Osgood Co., Marion, O. The McClellan-Jundersfeld Co., 45 William street, New York city, is inquiring tentatively for a 110-ton electric overhead crane.

The Corey Iron Co., Portland, Me., bought a 2-ton tramrail system from the Cleveland Crane & Engineering Co., Wickliffe, O. It is reported the Brooklyn Foundry Co., Brooklyn, contemplates purchasing, in addition to its recent orders, two 2-ton handpower cranes with 22-foot spans and one 5-ton crane with 30-foot span.

Locomotive crane orders include a 25-ton bucket handling crane, with 50-foot boom, for the Whitney Bros. Co., a Wisconsin concern, a 12½-ton, with 42-foot boom, for the Twohy Bros. Co., of Arizona, a 20-ton, with 50-foot boom, for the Russel Condon Construction Co., and a 12½-ton, with a 21-foot boom, for the Lorain Steel Co., Johnstown, Pa., all contracts going to the Industrial Works, Bay City, Mich.

Some lines of foundry equipment are moving briskly in the East. These include sand blast equipment, sand cutters and flasks. Trading in molding machines and plain tumblers is fair. Buying still is largely for replacement purposes, although several new projects are being figured, including a plant for the Fisher Sweeney Bronze Co., Hoboken, N. J. Plans just completed by Lockwood Greene & Co., 101 Park avenue, New York, call for a one and 2-story structure, 100 x 200 feet.

Sellers are now adhering rigidly to their official prices, there being little or no shading in any quarter. However, while the tendency is upward, there has been no advance recently in quotations. Of interest to sellers is the recent

award by the Passaic Valley Sewage commission, Newark, to Holbrook, Cabot & Rollins Corp., 52 Vanderbilt avenue, New York, of a heavy sewage extention into New York harbor. Announcement has not as yet been made of the sub contracts.

Buying Rate Is Being Maintained

CHICAGO, May 29.—Continued better buying of machine tools is being maintained. Several dealers in Chicago report May business will exceed any month for two years. This condition exists without any single large sales and is made up of numerous purchases of single tools or at most two or three. The effect of this buying has been to move considerable equipment from warehouse floors and to convert a gratifying part of inventory to actual cash. Prices on some lines have been reduced recently by manufacturers who did not modify their figures with competitors. The present cuts do not indicate a lowering of the market, but simply getting into line.

Selling representatives find sentiment among machine shop operators more inclined toward actual buying and where there is need for more equipment, and it can be financed, buying is either being done now or will be shortly. Secondhand equipment is plentiful and prices to make it move cause this to be bought, in preference to new tools. Railroads are not buying on their former inquiries and no new lists have been issued. The Studebaker Corp. has started its buying campaign for its enlarged plant at South Bend, by placing orders for special equipment which will require time for designing and building. Standard tools will be covered later. This business is considered important in the Chicago district as the Studebaker Corp. is one of the few automobile manufacturers of size whose natural market is Chicago. A sale of turret and engine lathes was made recently to a manufacturer of presses, who finds so much demand for his product that he is forced to add to his facilities. Punch presses are moving well, indicating a renewed demand. A ballbearing manufacturer at Chicago is adding to his machinery equipment.

Tool Demand Continues Upgrade

CLEVELAND, May 29.—Dealers in machine tools and shop equipment in this district continue to report demand on the upgrade. Manufacturing operations are being enlarged in practically all metalworking shops in this section and this betterment is being reflected in a steady demand for equipment. One large dealer in secondhand tools makes the satement that within the past month he has done more business than in a year. Another dealer reports that May was the first month in more than a year, in which a profit is shown on his books.

Sales of the past week have been numerous and include the purchase of a 26-foot lathe and a large drill press by the Commercial Forging Co., Cleveland, a 4-inch guilotine shear by a Canton, O., interest, a heavy-duty drill press by a Cleveland buyer and several automatics by an Indianapolis manufacturer. In addition to these it is understood several Detroit automotive interests recently purchased equipment from Cleveland tool manufacturers including planers, milling machines and grinders. Large individual sales are scarce, practically all of the orders being of the single tool class. These latter are exceptionally numerous and are being received from practically every line of industry. Machinery dealers here, however, are not satisfied with the demand from the Cleveland territory proper, stating that most of their orders are being received from cities outside the immediate district. This is thought to be due to the fact many Cleveland manufacturing organizations are well equipped to take care of the increased demand for their various products for some time to come. Little new machinery is being moved. Second-hand tools, however, are being taken at the prices asked for them and it is noticeable that these are firmer than has been the case for some time past. However, it is understood, that due to the firmer quotations on used equipment buying sentiment is turning toward new machinery. This is especially noticeable where used tool quotations are anywhere from 25 to 30 per cent of the prices asked for new equipment.

Inquiry continues extremely active. In addition to the regular run of small inquiries a number of larger ones are coming out. Dealers are quoting on the inquiry just issued by the Illinois Central railroad. Other railroad inquiries are not being acted on at this time but it is thought some buying will be undertaken within the near future. Lists of machine tool requirements are expected to be issued by the Erie and New York Central railroads according to Cleveland tool dealers. Cleveland board of education has not yet re-issued its list of requirements on which it recently rejected bids. The Youngstown, O. school board has advised bidders that all bids on the tools for which it recently inquired, have been rejected. It is not know whether or not a new list will be issued. A local machinery dealer reports that within the next few days a Buffalo manufacture will inspect 10 automatics. This dealer interest also reports it is in receipt of an inquiry for 21 lathes. Among the smaller inquiries in the market is one from the Commercial Forging Co., Cleveland, for a 4000-pound steam hammer, one from the Ohio Mfg. Co., Painesville, O., for a circular shear and one from the Carroll-Thompson Co., Columbus, O., for a grinder. In addition to these it is understood the King Tool Grinding Co., Cleveland, is in the market for a number of small tools and some machinery.

Crane Demand Is Active

PITTSBURGH, May 29.—Crane and hoist inquirers are closing on their requirements. This gives this branch of the equipment market more activity than in machine tools. Among recent sales consummated by the Shepard Electric Crane & Hoist Co. are the following: Two 10-ton cranes with 80-foot spans and 10 electric hoists to the Virginia Bridge & Iron Co., Roanoke, Va.; two 2-ton and one 4-ton hoists to the Austin Co., Cleveland; one 3-ton crane and one hoist to the Jones & Laughlin Steel Co., South Side, Pittsburgh; one 3-motor cage controlled 2-ton crane and one cupola charging monorail hoist to the Fox Furnace Co., Elyria, O.; one 5-ton crane trolley and two hoists to the Morrow Mfg. Co., Wellston, O.; two hoists each to the Fairmont Mining & Machinery Co., Fairmont, W. Va., the Blaw-Knox Co., Blawnox, Pa.; the Fairfield Paper Co., Baltimore, O.; the Superior Supply Co., Bluefield, W. Va., and the Humphreys Mfg. Co., Mansfield, O.; one hoist each to the Canton Bridge Co., Canton, O., Jones Bros. Structural Steel Co., Ravenna, O., one 3-ton 2-motor hoist, to the Columbia Steel & Shafting Co., Carnegie, Pa.; one 3-ton floor controlled crane to the Ohio Brass Co., Mansfield, O., and a monorail crane to the Pittsburgh Screw & Bolt Co., Pittsburgh. Early action is expected to be taken by the Follansbee Bros. Co., Follansbee, W. Va., on a 7½-ton crane; by the Universal Steel Co., Bridgeville, Pa., on a 5-ton crane; and by the Greenville Steel Car Co., Greenville, Pa., on a 10-ton crane. The 15 cranes wanted by the Pennsylvania railroad for Altoona, Pa., shops mostly are of one size and will be purchased in the East. Several tentative lists involving large numbers of cranes are being put out by engineers and others for the purpose of obtaining estimates on possible plant expansions. Perhaps one or two of these inquiries bear a relation to the Jones & Laughlin Steel Co.'s new plant at Hammond, Ind., and the National Tube

o.'s new tube mill at Gary, Ind. The tendency is growing mong crane builders to refrain from quoting prices below osts and the practice of obtaining at least cost is becoming ore decided.

In connection with machine tools activity has fallen off omewhat during the past week or so although small unit ales continue to be made from time to time. A local dealer isposed of a 48-ton press to a nearby user and other sales nvolve two small lathes, a blower, grinder, small drill, unch press, etc. Inquiries are plentiful; in fact, if one-half r even one-quarter of the pending business could be closed, everal dealers here would have all they could do for some ime. One inquiry for a hack saw comes from Montana. The curtailed buying this week is attributable in some measure to the contemplated reduction in freight rates. Pending inquiries include a 48-inch multiple punch, a 36-inch planer and a 7 or 8-foot boring mill. One house has received a tentative inquiry for a 72-inch mill and expects a confirming order soon.

Activity in foundry equipment is noteworthy for the reason that contrary to the usual practice numerous orders have been placed and are being placed so near the convention of the American Foundrymen's association in Rochester, N. Y. Molding machine orders have been particularly numerous. They include a large rollover machine and core machine for the Advance Boiler Corp., Poughkeepsie, N. Y.; 10 small jarring machines and one large shakeout with two large rollover machines for the Commonwealth Steel Co., Granite City, Ill.; a large rollover machine for the Oil Well Supply Co., Oil City, Pa., and one each large jar stripping plate machine for the National Sanitary Mfg. Co., Salem, O., and the A. P. Smith Mfg. Co., East Orange, N. J. Pending inquiries come from a widespread territory, including Den ver, Col., and points in Canada. Other recent sales consummated here include core ovens to the Lorain Steel Co., Johnstown, Pa., and the Coshocton Iron Co., Monongahela, Pa.; an electric furnace with a large number of flasks to a nearby foundry operator; a motor-driven sand mixer with screen to a Pittsburgh district user and a blower to a Virginia foundry interest.

Total Inquiry Shows Improvement

BOSTON, May 29.—Actual machine tool sales continue to be low in comparison with inquiry, but most dealers during the past week have found an improvement in the number and scope of inquiries. Most observers look for a gradual improvement in the market from now on until the middle of summer. Prices are without change except that in secondhand equipment the local situation is somewhat firmer in planers and tool room lathes. One tool manufacturer has recently reduced his price on one line of tools in order to move it in preparation for a new design which is to be brought out shortly.

Inquiry includes a list of 10 or 12 tools for an eastern Massachusetts manufacturer who is going into a new line of activity. One broaching machine has already been purchased against this list which seems to indicate that the balance will follow. Several railroads are in the market, but the financial situation at present is such that sales are not looked for before the first of July. Other inquiry comes from scattered small users throughout New England. Sales in Boston include two radial drills to a general machine shop; a 16-inch x 10-foot lathe to a Worcester manufacturer; a $3500 special lathe grinder and approximately 12 used tools to as many different users. New England manufacturers report little change throughout the country, in the demand for tools. The West continues to be the best customer.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

WILMINGTON, DEL.—The Wilmington Sugar Refining Co. plans a power house, one story, 90 x 95 feet.

CASEY, ILL.—The Western Radiator Corp. plans a factory building, two stories, 150 x 280 feet, to cost about $100,000.

CHICAGO—The Kremer Metal Products Co., 721 Fulton street, has been incorporated to manufacture and deal in metal products, by W. H. Kremer, D. H. Kremer and J. O. Helschemacher. The company is represented by Osborne & Elins, Harris Trust building.

CHICAGO—The A. F. Ramacek Marine Corp., 4645 Broadway, has been incorporated with $10,000 capital stock to deal in and rebuild ships, etc., by A. F. Ramacek, S. O. Ramacek and George W. Spikings Jr. The company is represented by A. F. Ramacek, 4645 Broadway.

CHICAGO—The Kobzy Mfg. Co., 553 West Monroe street, has been incorporated with $5000 capital stock to manufacture and deal in tools, dies and machine shop products, by Steven Kobzy, C. W. Greenfield and Edward H. Bachs. The company is represented by C. W. Greenfield, 117 North Jefferson street.

CHICAGO—The Illinois Range Co., 169, 173 West Ann street, has been incorporated with $15,000 capital stock to manufacture and deal in ranges, etc., by Mike Emmer, Louis Emmerman and Nicholas J. Porte. The company is represented by William Foldman, 1225, 11 South La Salle street.

CHICAGO—The Thordarson Transformer Co., 700 Kingsbury street, has been incorporated with 250 shares of no par value, to manufacture and deal in electrical devices and appliances, by C. H., D. C. and J. G. Thordarson. The company is represented by Lamert & Mayer, 10 South La Salle street.

CHICAGO—The Rauland Mfg. Co., 35 North Dearborn street, has been incorporated with $12,000 capital stock to manufacture and deal in electrical and mechanical motors, etc., by Einar Rauland, Paul K. Cramblot, Siegfried J. Karas and Joseph Karas. The company is represented by Lloyd D. Heath, 1034 First National Bank building.

CHICAGO—The Trimm Radio Mfg. Co., 24 South Clinton street, has been incorporated to manufacture and deal in radio and electrical appliances, with $25,000 capital stock by Fred I. Gillick, Walter H. Trimm, Harry T. Bennett and Victor P. Arnold. The company is represented by Castle, Long & Castle, 103 West Monroe street.

CHICAGO—The American Stamping Works, Inc., 219 South Peoria street, has been incorporated with $15,000 capital stock to manufacture and deal in steel ceilings and sheet metal products, by Davis Osherman, Ben Malkin, Edward Shanklin and others. The company is represented by Joseph Kohn, 109 North Dearborn street.

LA GRANGE, ILL.—The Kastory Mfg. Co., maker of automobile bodies, plans the erection of a 1-story plant addition, 100 x 125 feet, to cost about $40,000.

LAMONT, ILL.—The Illinois Pure Aluminum Co. has started work on a factory building addition, one story, to cost $35,000.

MARENGO, ILL.—The Elgin & Belvidere

Electric railway contemplates the erection of a 2-story power house, 50 x 105 feet, to cost about $50,000.

PEORIA, ILL.—Work has been started on the erection of a factory building for the Peoria Spring Co., manufacturer of automobile springs, etc. Al Randall is president of the company.

PONTIAC, ILL.—The Pontiac Valve Co., 417 Sherman street, has been incorporated to manufacture automobile valves, accessories, etc., with $150,000 capital stock by Charles P. Clarke, Frank S. Shaw and George Walton. The company is represented by Attorneys Truesburg, Wilson & Armstrong, 412 Storry block.

HAMMOND, IND.—The Calumet Tank & Mfg. Co. is reported planning a foundry building, one story, 60 x 140 feet, to cost $75,000.

HAMMOND, IND.—The New York Car Wheel Co., Buffalo, has purchased 15 acres here on which it is reported planning a plant at an estimated cost of $250,000.

NEW ALBANY, IND.—The Interstate Public Service Co. plans a gas plant addition, two stories, 36 x 36 feet.

SOUTH BEND, IND.—The Indiana Michigan Electric Co. has started work on a plant addition, one story, 50 x 50 feet.

BALTIMORE—The Locke Insulator Corp. plans a plant building, 80 x 80 feet.

BALTIMORE—The Maryland Steel Products Co. contemplates a warehouse and fabricating shop, one story.

BALTIMORE—The O. F. Reiter Mfg. Co., 200 North Holliday street, has been incorporated with $100,000 capital stock, by O. F. Reiter, Samuel Goldman and Eugene V. von Newendorf.

BALTIMORE—The Edro Richardson Brass Co., 318 North Holliday street, has purchased a group of buildings which it is understood it will utilize as a plant.

ATTLEBORO, MASS.—The American Canbec Co. has been incorporated to make fire extinguishers, etc., with $50,000 capital stock by Henry O. Girard, Lowell, Mass., Albert D. Laneville, Manchester, N. H., and William Cloutier.

BOSTON—The Arnold Electrical Mfg. Co. has been incorporated with $5000 capital stock by Charles Earle Arnold, Arlington, Mass., and Herbert H. Richardson.

BOSTON—All Cheer Windshields, Inc., has been incorporated to make automobile accessories with $350,000 capital, by David Fishman, Arthur M. McGinness and S. T. Woleyko.

BOSTON—The Electric Engineering Corp. has been incorporated to build machinery with $25,000 capital, by Frederick H. Altekamp, Brookline, Mass., Fred H. Horneman and William J. Barkley, Winthrop, Mass.

BOSTON—The Shaw Specialty Co. has been incorporated to make mechanical devices with $100,000 capital, by A. B. Shaw and William V. Burton, both of Medford, Mass., and Francis A. Cross.

BOSTON—The Hartley Clock Co. has been incorporated to make signal apparatus with $1,300,000 capital, by John S. Hartley, Lynn, Mass., Charles W. McDermott, Brookline, Mass., and Thomas H. Ray, Wellesley, Mass.

BOSTON—The Atlas Electric Corp. has been incorporated to make electrical specialties, etc., with $98,000 capital stock by Charles F. Cheney, Newtonville, Mass., John H. Hodson, Lynn, Mass., and Louis S. Shiro.

CAMBRIDGE, MASS.—The Simplex Wire & Cable Co., Boston, has let the contract for the erection of a factory addition, four stories, 90 x 100 feet.

EAST CAMBRIDGE, MASS.—The Boston & Maine railroad has let the contract for a 1-story, 90 x 250-foot repair shop.

GLOUCESTER, MASS.—The Murmac Mfg. Co., Inc., has been incorporated to operate a machine shop with $25,000 capital stock by John A. Moran, David E. Murphy and Morgan J. McSweeney, all of Salem, Mass.

LAWRENCE, MASS.—Rubwood, Inc., has been incorporated to make steel products with $800,000 capital stock by Harry N. Atwood, Boston, Frank M. Andrew and T. Edwin Andrew, both of Methuen, Mass.

NEW BEDFORD, MASS.—The Air-Tite Mfg. Co. has been incorporated to make automobile accessories, etc., with $100,000 capital stock by Emile L. Galipeau, Aldege Chausse and Alfred R. Galipeau.

SPRINGFIELD, MASS.—The Keating Valve Co. has been incorporated with $50,000 capital, by Henry L. Bowles, Charles Sumner Vining and Richard J. Talbot.

SPRINGFIELD, MASS.—The Kobert Supplementary Pulley Rim Co. has been incorporated with $75,000 capital stock by Frank P. Kobert, James A. Redemann and George R. Stobbs, Worcester, Mass.

SPRINGFIELD, MASS.—The Hampden Grinding Wheel Co. has been incorporated to take over the Hampden Corundum Wheel Co. with $100,000 capital stock, by Willard P. Leshure, Frank S. Hatch, Longmeadow, Mass., and John M. Collins, West Springfield, Mass.

WESTFIELD, MASS.—The Foster Machine Co. has let the contract for the erection of four factory additions, the largest of which will be one story, 80 x 120 feet, and utilized as a machine shop.

DETROIT—The Kelsey Wheel Co. is reported planning the erection of an addition to its plant here.

DETROIT—The Kermath Mfg. Co., 5880 Commonwealth avenue, maker of marine engines, plans a 2-story plant addition, 35 x 60 feet.

KALAMAZOO, MICH.—Part of the plant of the Reed Foundry & Machine Co. recently was damaged by fire.

DELAIR, N. J.—The Kieckhofer Container Co. plans a manufacturing plant.

MELLVILLE, N. J.—A $150,000 plant will be erected here by the Thompson Machine Co. According to plans by Fletcher-Thompson, Inc., Bridgeport, Conn., engineers in charge, the structure will be 2-stories.

NEWARK, N. J.—The Steam Automotive Co. has been incorporated with $100,000 capital stock, by George L. Seymour, Emery P. Vanephs and George E. Doyen.

PERTH AMBOY, N. J.—The plant of the United Lead Co. recently was damaged by fire.

TRENTON, N. J.—The Trenton File Co., Inc., is having plans drawn for a boiler house, one story, 30 x 50 feet.

BINGHAMTON, N. Y.—T. H. Wilbur & Son plans the erection of a 1-story machine shop, 88 x 100 feet, to cost about $17,000.

BROOKLYN, N. Y.—N. Wasserman, Inc., 4406 Sixteenth avenue, maker of pipe, plumbing equipment, etc., plans a 2-story shop building to cost about $50,000.

BROOKLYN, N. Y.—The Ober-Rubin Turning & Carving Corp. has been incorporated with $5000 capital stock by M. Rubin, S. I. Ober and H. J. Sanders. The company is represented by Attorney N. B. Finkelstein, 51 Chambers street.

BUFFALO—J. Emig & Son, 44 Henry street, plan a machine shop building, one story, 50 x 80 feet.

GENESEO, N. Y.—The Livingston Light &

Business Changes Recently Announced

REMOVAL of its plant from Ft. Wayne, Ind., to Findlay, O., has been completed by the Visible Pump Co. The company expects to begin production in its new plant shortly. W. A. Hollington, Findlay banker, has been named as president of the company.

* * *

Joseph T. Ryerson & Son have moved their foreign department from Chicago to 30 Church street, New York.

* * *

The Tell City Foundry & Machine Works, Tell City, Ind., has changed its name to the Tell City Garage & Machine Works.

* * *

New York City offices of the Patterson-Kelly Co., maker of heating apparatus, have been moved to 101 Park avenue.

* * *

New offices have been taken by the Foamite Firefoam Co. at 151 Fifth avenue, New York. Formerly the company was at 200 Fifth avenue.

* * *

Walter R. Pflasterer, 527 Manhattan building, Chicago, has been appointed agent in that territory for the Track Specialties Co., 29 Broadway, New York.

* * *

Hudson Motor Car Co. and the Essex Motors, Inc., both of Detroit, have been merged into one company under the name of the Hudson Motor Car Co.

* * *

Purchase of the plant of the F. R. Fortune Tool Co., Wooster, O., recently was made by the Canton Rim Co. The new owner plans to enlarge the plant by the erection of an addition.

* * *

The Union Chain & Mfg. Co., which has operated in Seville, O., for a number of years is moving its plant to Sandusky, O. It will occupy the plant formerly used by the Lake Shore Portland Cement Co.

* * *

Management of the Northwest agency for asbestos roofing for Johns-Mansville Co. has been assumed by the Independent Sheet Metal Co., Seattle. V. G. Greene, formerly of the Johns-Mansville Co. is manager of hte Independent organization.

Announcing "AMERICAN NICKEL"

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AMERICAN MALLEABLE NICKEL is manufactured from the purest nickel obtainable,—insuring an unvarying, uniform product. It is produced under the "Hennig" Process and will analyze over 99% nickel.

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Pittsburgh, Pa.

Power Co. plans to construct a power house.

HAMMONDSPORT, N. Y.—Part of the plant of the Keuka Industries, Inc., maker of motors, etc., recently was damaged by fire.

LONG ISLAND CITY, N. Y.—The Wheeling Corrugating Co., 16 Desbrose street, New York, plans a warehouse, six stories, 120 x 140 feet.

NEW YORK—Part of the plant of the Tidewater Oil Co., 11 Broadway, at Bayonne, N. J., recently was damaged by fire.

NEW YORK—The Crescent Radio Mfg. Corp. has been incorporated with $25,000 capital stock by H. C. Broems, R. Davison and C. P. Cadman. The company is represented by Attorneys Lind & Pfeifer, 46 Cedar street.

NEW YORK—The American Marine Device Corp. has been incorporated with $30,000 capital stock, by F. Wetjeb, N. J. McNeil and F. Cooper. The company is represented by R. M. Kelly, 256 Broadway.

NEW YORK—The Mosler Metal Products Corp. has been incorporated with $25,000 active capital stock, by S. A. Copen, E. G. Davidson and J. P. H. Riepes. The company is represented by Feiner & Maass, 66 Pine street.

NEW YORK—The Wander Iron Works has been incorporated with $25,000 capital stock by J. J. Myers, S. Friedman and A. Mopper. The company is represented by Hartman, Sheridan & Tekulsky, 152 West Forty-second street.

NEW YORK—The Cee-Dee Mfg. Co. has been incorporated to make plumbers' supplies with $10,000 capital stock by G. H. Richards, W. Scott and C. Y. Healy. The company is represented by Attorney S. Hanford, 41 Wall street.

NEW YORK—The Simplex Fuel Oil Engineering Co., devices, has been incorporated with $10,000 capital stock, by H. E. Scholes, E. B. Wineta and N. Casden. The company is represented by Attorneys Ferris & Ansbacher, 2 Rector street.

OSWEGO, N. Y.—The David Fitzgibbons Boiler Co. has been incorporated with $100,000 capital stock by D. P. and M. and J. A. Fitzgibbons. The company is represented by F. D. Culkin.

PORT JARVIS, N. Y.—Swinton & Co., 47 Main street, plan a foundry building, one story, 72 x 152 feet, to cost $40,000.

RENSSELAER, N. Y.—The Rensselaer Machine Co. has been incorporated with $5000 capital stock by H. Billing, W. E. Gordon and H. M. Van Alstyne. The company is represented by Attorney E. L. Boothby, Albany, N. Y.

ROCHESTER, N. Y.—W. P. Farley, 1005 Harvard street, plans the erection of a 1-story machine shop to cost about $13,000.

ROCHESTER, N. Y.—The Yawman & Erbe Mfg. Co. plans a factory building, three stories on Jay street near the New York Central railroad tracks.

SCHENECTADY, N. Y.—The capital stock of the General Electric Co. has been increased from $185,000,000 to $220,000,000.

SYRACUSE, N. Y.—The E-Z Car Control Corp., railway equipment, has been incorporated with $100,000 capital stock, by W. M. and F. A. Lawre. The company is represented by Attorney A. Coon.

TONAWANDA, N. Y.—The American Kardex Co. plans the erection of a 2-story addition to cost about $35,000.

YOUNGSTOWN, N. Y.—The Peerless Body Corp. has been incorporated with $50,000 capital stock, by B. D. and N. D. Haskell and C. W. Robertson. The company is represented by Attorney H. C. Habel, Buffalo.

CHARLOTTE, N. C.—The Velvet Action Brake Lining Co. has been incorporated with $100,000 capital stock, by J. C. Barefoot, A. A. Knee and S. L. Bagby.

ELIZABETH CITY, N. C.—The Gordon Soy Bean Harvester Co. has been incorporated with $200,000 capital stock by G. G. Markham, C. R. Pugh and G. G. Gaither, to manufacture machines for picking and harvesting grain.

CINCINNATI—The Formica Insulation Co. recently increased its capital stock from $100,000 to $150,000.

CLEVELAND—The Masculine Laundry & Cleaning Co. has taken out a permit to erect a boiler room at 2711-17 West Twenty-fifth street.

CLEVELAND—A permit has been granted to the A. & B. Box Co., 8626 Woodland avenue, for a brick and steel factory building to be erected at an estimated cost of $35,000.

CLEVELAND—The American Body Co. has been incorporated with $200,000 capital stock, by Chester A. Humel, John P. Kalina, Engineers building, and others.

CLEVELAND—The Cleveland Refractories Co. has been incorporated with $10,000 capital stock, by S. Q. Kerruish, Society for Savings building, Herbert A. Quayle, and others.

CLEVELAND—The Kirk-Latty Mfg. Co., 1971 West Eighty-fifth street, has taken out a permit to erect a brick boiler house at an estimated cost of $10,000.

CLEVELAND—The Buckeye Furnace & Sheet Metal Co. recently was incorporated with $2500 capital stock, by A. W. Haiman, Society for Savings building, D. F. Klein, and others.

CLEVELAND—The Sands Mfg. Co., 5407 Sweeney avenue, has taken out a permit to erect a warehouse building at an estimated cost of $25,500.

CLEVELAND—The Iten Fibre Co. has been incorporated with $50,000 capital stock by Charles J. Iten, Paul Thompson, Engineers building, W. J. Dawley, E. K. Curtiss and George S. Myers.

CLEVELAND—The Power Investment Co., 929 Williamson building, has leased the old power house of the Cleveland Railway Co. at Cedar avenue and Ashland road, and plans to remodel the plant and erect an addition to it at an estimated cost of $350,000. Charles F. Cox is president of the company.

COLUMBUS, O.—Work is progressing rapidly on a new plant here for the Brown Steel Co. The fabricating shop is to be 60 x 305 feet; the structural yard, 75 x 315 feet, and jobbing warehouse, 50 x 305 feet. The plant will be equipped with electric traveling cranes. William F. Brown is president and treasurer of the company.

DAYTON, O.—The Dayton Power & Light Co., Fourth and Jefferson streets, plans an extension to its plant.

GREENVILLE, O.—The Shackless Spring Co. has been incorporated with $50,000 capital stock by A. W. Rush, James H. Westfall, James Lephart, Fred N. Lephart and J. W. Lephart.

KENMORE, O.—The Palmer Match Co., Charles A. Palmer, president, Second National Bank building, Akron, O., plans a factory building.

LOGAN, O.—The Logan Foundry & Machine Co. is enlarging its plant. Two new buildings, one 60 x 100 feet and the other 60 x 90 feet, are under construction.

LOGAN, O.—The Happy Home Steam Washing Machine Co. has been incorporated with $50,000 capital stock by C. T. Warren, Estella Hartley, Isabella Barker, Charles F. Barker and Ada Cohagen.

MARION, O.—The Cantwell Building Forms & Material Co. recently was incorporated with $75,000 capital stock and it is reported will erect a plant here for the manufacture of metal forms. E. A. Cantwell and George T. Cleveland are among the incorporators.

MARTIN'S FERRY, O.—Plans are being prepared for a steel foundry building for the C. L. Dorer Foundry Co. The structure will be erected at an estimated cost of $10,000.

MINERAL RIDGE, O.—The Ohio Oxygen Co. has purchased a site on which it is reported planning to erect a factory building.

OTTAWA, O.—The Pauling Electric Service Co. plans a power plant.

PORTSMOUTH, O.—The Portsmouth Stove & Range Co. plans the erection of a 3-story plant addition.

TORONTO, O.—The Lincoln Motor Body Co. has been incorporated with $15,000 capital stock, by Leonard S. Owings, Arnold Davis Jr., Frank M. Meyers, James S. Owings and Frank C. Foss.

WEBSTER, O.—The Woodward Machine Co. is reported planning a plant building, one story, 85 x 500 feet.

BRIDGEPORT, PA.—Gehret Bros., operating a structural steel and iron works, have had plans prepared for a plant addition, 1-story, 120 x 200 feet, to cost $50,000.

CANADENSIS, PA.—George W. Backoff, architect, 40 Park place, Newark, N. J., is preparing plans for a power house and hotel here. The name of the owner has been withheld.

DANVILLE, PA.—The Art Bronze & Iron Works has been incorporated with $50,000 capital stock by D. J. Reese and others.

HARRISBURG, PA.—The local board of education soon will take bids on a 1-story power plant, 40 x 100 feet, to cost $150,000. D. D. Hammelbaugh, 121 Chestnut street, is secretary of the board.

PHILADELPHIA—H. H. Barton & Son Co. plans a factory building, two stories, 40 x 100 feet.

PHILADELPHIA—The Philadelphia Tramrail Co. plans a factory building, one story, 60 x 90 feet.

PHILADELPHIA—The International Harvester Co. of America plans a warehouse, 5 stories, 100 x 130 feet, at a cost of $142,000.

PHILADELPHIA—The Central Construction & Supply Co. plans a plant for the manufacture of builders supplies, to be 2-stories, 228 x 350 feet, and cost about $80,000.

PHILADELPHIA—The Triplock Mfg. Co., automobile accessories, has been incorporated with $5000 capital stock by Harold Krauskopf, Thirty-sixth and Barring streets, and others.

PHILADELPHIA—The East St. Clair Light & Power Co. has been incorporated with $5000 capital stock by C. A. McClure, 1014 South Forty-sixth street and others.

PHILADELPHIA—George W. Lindley, 5122 Wakefield street, has awarded a contract for a 2-story plant addition, 40 x 100 feet, to be devoted to general machine work.

PITTSBURGH—The plant of the Pittsburgh Iron Folding Bed Co., 1106-14 Reedsdale street, recently was damaged by fire.

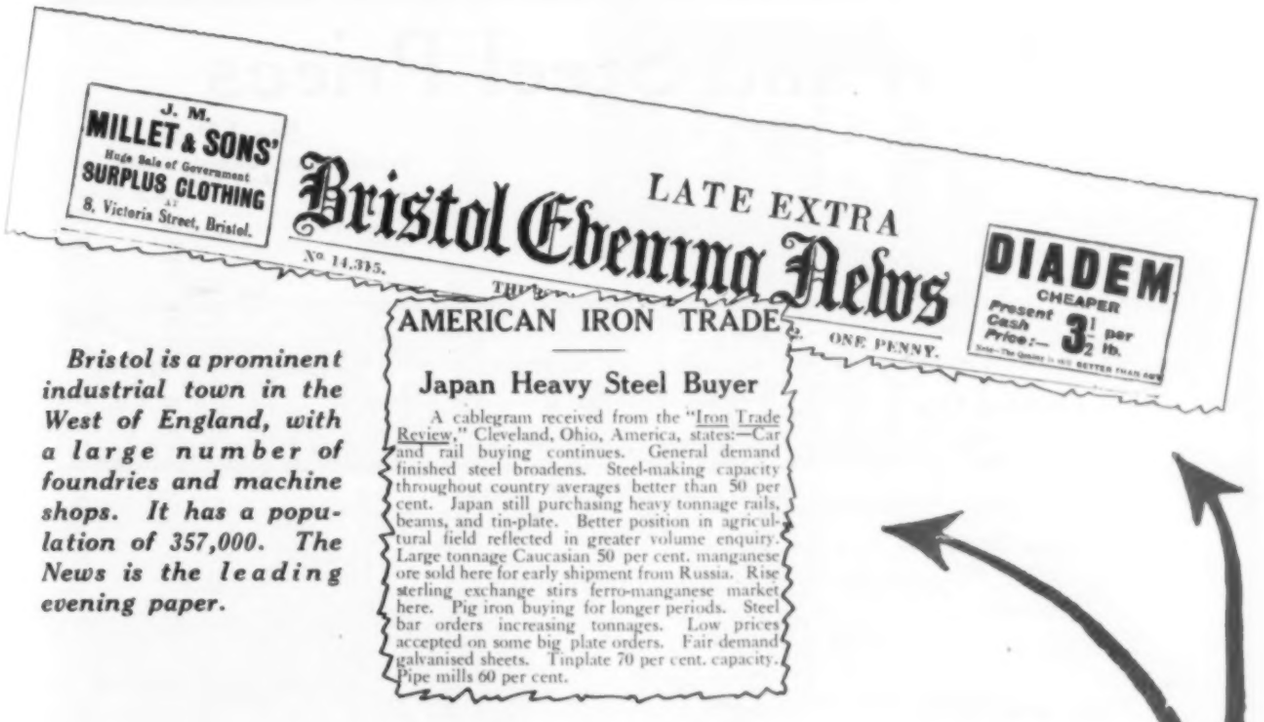
PITTSBURGH—The Kund & Eiben Mfg. Co., 204 Warrington avenue, maker of hardware products, has purchased a site on which it plans a plant.

STROUDSBURG, PA.—The Pennsylvania Steel & Wire Co. has started work on the erection of a plant addition.

SUNBURY, PA.—The Sunbury Water Co. plans a boiler house, one story, 50 x 50 feet.

WASHINGTON, PA.—The Charcoal Iron Products Co. has been incorporated with $250,000 capital stock to manufacture iron and steel products, by A. C. Warne, care of the Washington Trust Co., Washington; Wray C. [illegible] and George N. Wolfe.

(*Continued on Page* 1608)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3½ per lb.
AMERICAN IRON TRADE
Japan Heavy Steel Buyer
A cablegram received from the "Iron Trade Review," Cleveland, Ohio, America, states:—Car and rail buying continues. General demand finished steel broadens. Steel-making capacity throughout country averages better than 50 per cent. Japan still purchasing heavy tonnage rails, beams, and tin-plate. Better position in agricultural field reflected in greater volume enquiry. Large tonnage Caucasian 50 per cent. manganese ore sold here for early shipment from Russia. Rise sterling exchange stirs ferro-manganese market here. Pig iron buying for longer periods. Steel bar orders increasing tonnages. Low prices accepted on some big plate orders. Fair demand galvanised sheets. Tinplate 70 per cent. capacity. Pipe mills 60 per cent.

Bristol is a prominent industrial town in the West of England, with a large number of foundries and machine shops. It has a population of 357,000. The News is the leading evening paper.

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Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

PORT HENRY IRON ORE

Per Gross Ton, F.o.b., Port Henry

Old bed 21 furnace	$4.85
Old bed concentrates, 63 per cent	5.75
Harmony, cobbed, 63 per cent	5.75
New bed, low phos., 65 per cent.	8.50
Lump ore for fix	6.00

Manganese Ore

Brazilian, 48 to 50 per cent c.i.f. Atlantic ports, 26½ to 28 cents per unit.

Indian 48 to 50 per cent c.i.f. Atlantic ports, nominal per unit.

Caucasian, 48 to 50 per cent, c.i.f. Atlantic ports, 27 cents per unit.

Fluor Spar

Washed gravel Kentucky and Illinois mines, per ton.....$16.00 to 17.50

Rivets

Structural rivets	2.25c
Boiler rivets, Pittsburgh	2.35c
Rivets ⅞-in. and smaller, Pittsburgh	70-10-10 off

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NUTS

(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank or tapped	$4.75 off list
Cold punched square or hexagon blank or tapped	$4.75 off list
Cold punched semifinished hexagon nuts ⅝-in. and larger	75-10-5 off
Cold punched semifinished hexagon nuts ½-inch and smaller	80-10-5 off
Case hardened, finished, hexagon	70 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

⅜ x 6 inches, smaller and shorter

Rolled thread	65-5 off
Cut thread	60-5 off
Larger and longer	60-5 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	65-10-5 off
Cut thread	65-5 off
Larger and longer	65-5 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	60 off
Larger and longer	60 off
Lag screws	65-10 off
Plow bolts Nos. 1, 2 and 3 heads	50-10 + 20 off
Tap bolts	30-10 off
Bolt ends with hot pressed nuts	65-5 off
Blank bolts	65-5 off
Rough stud bolts with nuts	50-10 off

Warehouse Prices

STEEL BARS

Boston	2.505c
Buffalo	2.60c
Chicago	2.38c
Cincinnati	2.50c to 2.75c
Cleveland	2.31c
Detroit	2.48c
New York	2.48c to 2.53c
Philadelphia	2.46c
San Francisco	3.25c
Seattle	3.25c
St. Louis	2.475c
St. Paul	2.66c
Los Angeles	3.25c

IRON BARS

Boston	2.505c
Buffalo	2.45c
Chicago	2.38c
Cincinnati	2.50c to 2.75c
Detroit	2.48c
New York	2.48c to 2.58c
Philadelphia	2.46c
St. Louis	2.475c

SHAPES

Boston	2.605c
Buffalo	2.70c
Chicago	2.48c
Cincinnati	2.60c to 2.85c
Cleveland	2.41c
Detroit	2.58c
New York	2.58c to 2.63c
Philadelphia	2.56c
San Francisco	3.25c
Seattle	3.25c
St. Louis	2.575c
St. Paul	2.76c
Los Angeles	3.35c

PLATES

Boston	2.605c
Buffalo	2.70c
Chicago	2.48c
Cincinnati	2.60c to 2.85c
Cleveland	2.31c
Detroit	2.58c
New York	2.58c to 2.63c
Philadelphia	2.56c
San Francisco	3.25c
Seattle	3.35c
St. Louis	3.625c
St. Paul	2.76c
Los Angeles	3.50c

NO. 10 BLUE ANNEALED SHEETS

Boston	3.305c to 3.48c
Buffalo	3.60c
Chicago	3.53c
Cincinnati	3.50c to 3.75c
Cleveland	3.15c to 3.25c
Detroit	3.48c
New York	3.48c
Philadelphia	3.40c
San Francisco	4.30c
Seattle	4.65c
St. Louis	3.625c
St. Paul	3.81c
Los Angeles	4.70c

NO. 28 BLACK SHEETS

Boston	4.65c
Buffalo	4.45c
Chicago	4.30c
Cincinnati	2.75c
Cleveland	3.90c to 4.00c
Detroit	4.23c
New York	4.35c
Philadelphia	4.25c
San Francisco	5.80c
Seattle	5.65c
St. Louis	4.395c
St. Paul	4.58c
Los Angeles	5.80c

NO. 28 GALVANIZED SHEETS

Boston	5.65c
Buffalo	5.45c
Chicago	5.30c
Cincinnati	5.10c
Cleveland	4.90c to 5.00c
Detroit	5.23c
New York	5.35c
Philadelphia	5.25c
San Francisco	6.65c
Seattle	6.65c
St. Louis	5.395c
Los Angeles	6.65c

BANDS

Boston	3.005c
Buffalo	3.20c
Chicago	3.13c
Cincinnati	3.10c to 3.35c
Cleveland	2.81c
Detroit	3.08c
New York	2.98c to 3.13c
Philadelphia	2.96c
San Francisco	3.90c
Seattle	3.75c
Los Angeles	4.00c

HOOPS

Boston	3.415c
Buffalo	3.35c
Cleveland	2.81c
Detroit	3.23c
New York	3.38c
Philadelphia	3.21c
Seattle	4.75c

COLD ROLLED SHAFTING

Boston (round)	3.20c
Buffalo	3.40c
Chicago	3.30c to 3.80c
Cincinnati (round)	3.25c to 3.35c
Detroit (round)	3.15c
New York	3.35c
New York (flats, squares and hexagons)	3.85c
Philadelphia (rounds)	3.20c
San Francisco	4.65c
Seattle	4.75c
Los Angeles	5.10c
Boston, flats, squares and hexagons	3.70c

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
Butt Weld		
⅜-inch	54½	28
¼ and ⅜-inch	60	33½
½-inch	65	50½
¾-inch	69	56½
1 to 3-inch	71	58½
Lap Weld		
2-inch	64	51½
2½ to 6-inch	68	55½
7 to 8-inch	65	51½
9 to 12-inch	64	50½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	69	56½
Lap Weld		
2-inch	62	49½
2½ to 6-inch	66	53½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	50½	33
¼ and ⅜-inch	56	38½
½-inch	62	50½
¾-inch	67	55½
1 to 1½-inch	69	57½
2 to 3-inch	70	58½
Lap Weld		
2-inch	62	50½
2½ to 4-inch	66	54½
4½ to 6-inch	65	53½
7 to 8-inch	61	47½
9 to 12-inch	55	41½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	51	40½
¾ to 1½-inch	54	43½
2 to 2½-inch	56	45½
Lap Weld		
2-inch	50	40½
2½ to 4-inch	52	42½
4½ to 6-inch	51	41½
7 to 8-inch	47	33½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	3½	+22½
½-inch	36½	18½
¾-inch	42½	27½
1 to 1½-inch	44½	29½
Lap Weld		
2-inch	39½	25½
2½ to 6-inch	42½	29½
7 to 12-inch	40½	27½
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+ 4½	+37½
½-inch	35½	23½
¾-inch	42½	28½
1 to 1½-inch	44½	30½
Lap Weld		
2-inch	40½	27½
2½ to 4-inch	43½	31½
4½ to 6-inch	42½	30½
7 to 8-inch	35½	23½
9 to 12-inch	30½	18½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+27	+39
¾-inch	+ 7½	+19½
1-inch	+23½	+35½
1¼-inch	+ 7½	+19½
1½-inch	+ 6½	+18½
Lap Weld		
2 and 2½-inch	7½	14½
3 to 4-inch	12½	3½
4½ to 6-inch	11½	2½
8-inch	8½	

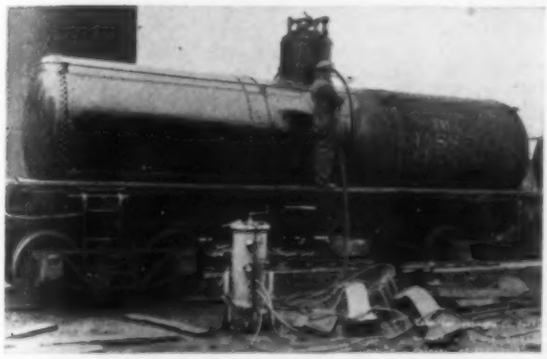
Boiler Tubes

L. C. L. discounts. C. L. 4-Point differential

STEEL	
1¾-inch	22½
2 and 2¼-inch	37
2½ to 3-inch	48
3¼ to 4-inch	53
IRON	
1½-inch	1
1¾-inch	11
2 and 2¼-inch	21
2½ to 3-inch	26
3¼ to 4½-inch	28
SEAMLESS	
1¾-inch	17
2 to 2¼-inch	30
2½ to 3-inch	38
3¼ to 5-inch	43

"VORTEX"

PAINTING ECONOMY



Tank car painted in 40 minutes with the "Vortex" Painter at the plant of the Grasselli Chemical Co., Cleveland, Ohio.

Press room of the Henderson Lithograph Co., Cincinnati, Ohio, painted with Vorcolite paint, and the "Vortex" Painter.

A Few of the Many Prominent Users:

Westinghouse Electric & Mfg. Co.; General Electric Co. (National Lamp Works); Ludlum Steel Co.; Jones & Laughlin Steel Co.; Gary Screw & Bolt Co; Warren City Tank & Boiler Co.; West Va. Pulp & Paper Co.; Whitlock Cordage Co.; Bessemer Gas Engine Co.; Canton Sheet Steel Co.; North East Electric Co.; McLoughlin Textile Corporation; Dayton Malleable Iron Co.; Canton Bridge Co.; Henry Disston & Sons, Inc.

Our Demonstration Proposal:

We shall be very glad indeed of an opportunity to make a practical demonstration of the Vortex Painting Method at your plant, at which time we will instruct your men fully in its operation.

May our representative call and talk it over with you?

THE "VORTEX" METHOD

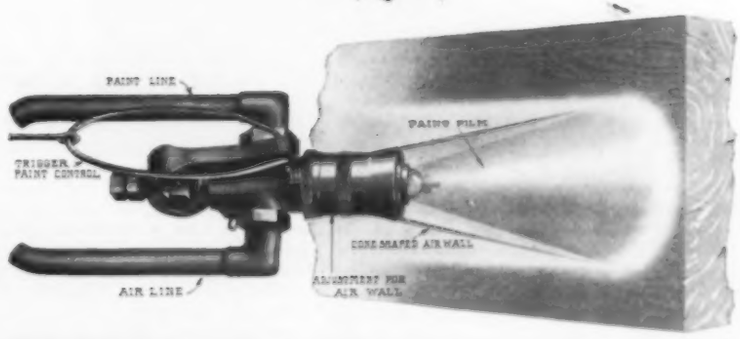
We supply high grade paint for all interior and exterior surfaces, and furnish our equipment for applying same. Thus equipped, your workmen can do your painting in the shortest possible time with the least interruption to your plant activities, and at lowest cost per square foot.

THE PAINT

Technically correct coating for all exterior and interior purposes, especially prepared for mechanical application. When applied through the Vortex Painter, a finished painting job, inside or out, can be accomplished in a single application on any kind of surface.

THE EQUIPMENT

Vortex Painter enables one man to do the work of a dozen brush men. Because of the "long arm", very little scaffolding is required. The Vortex Nozzle illustrated below confines the paint stream inside of a high powered cone of compressed air, thus paint clouds and wastage of material are avoided. The Vortex Method is clean, quick and economical.



THE VORTEX MANUFACTURING CO.

1978 West 77th. St. CLEVELAND, OHIO.

East of the Mississippi

(*Continued from Page* 1604)

NEWPORT, R. I.—The Hydro-Carbon Burner Mfg. Co. has increased its capital stock from $100,000 to $200,000.

PROVIDENCE, R. I.—The Powers & Mayer Mfg. Co., Inc., has let the contract for a 2-story, 80 x 90-foot factory.

PROVIDENCE, R. I.—The Textile-Finishing Machinery Co. has let the contract for the erection of a 1-story factory building addition.

PROVIDENCE, R. I.—The Silver & Drain Co., Inc., 228 South Main street, maker of ventilating equipment, plans a 1-story plant addition, 50 x 100 feet.

PROVIDENCE, R. I.—C. C. King & Co., Inc., has been incorporated to make jewelry with $20,000 capital stock by Clifford G. King, Edward C. Stiness and Daniel H. Morrissey.

CHATTANOOGA, TENN.—The Somerville Iron Co. plans a plant addition.

EAST CHATTANOOGA, TENN.—The H. L. Judd Co., 87 Chambers street, New York, is reported planning additions to its plant here.

NASHVILLE, TENN.—The Automatic Silent Alarm Co., automatic alarms, has been incorporated by F. C. Bailey, John W. Gaines Jr., and H. M. Gaither.

CLIFTON FORGE, VA.—The Virginia Western Power Co. plans an addition to its power plant.

LYNCHBURG, VA.—The Lynchburg Railway & Power Co. plans a power plant addition.

MARTINSVILLE, Va.—The American Furniture Co. plans a 1-story boiler plant addition.

PETERSBURG, VA.—The Petersburg Farm Machine Corp., 1009 South Sycamore street, plans a 1-story factory building.

BORLAND, W. VA.—The Borland Springs Spring Co. has been incorporated with $100,000 capital stock by W. F. Wetzel, Bridgeport, O.; H. Menge, P. R. Benenberger, L. F. Borman and T. P. McEwen, Wheeling, W. Va.

FAIRMONT, W. VA.—The machine shop of A. B. Knight, which was recently damaged by fire, will be rebuilt.

NITRO, W. VA.—The Pickering Chemical Co. has been incorporated with 7000 shares of no par value, by Oscar W. Pickering, Arlington, N. J., John W. Hartman, Arthur L. Walker, New York; Harry E. Martin and Leslie L. Cook, New York.

PARKERSBURG, W. VA.—The Seward Wire Co., recently organized, plans to erect a plant, 1-story, 80 x 200 feet.

APPLETON, WIS.—A county garage for all motor trucks, highway machinery, etc., will be built by the county board on the asylum farm at a cost of $50,000. The building will be 50 x 200 feet, with a wing, 50 x 75 feet, to serve as a machine and repair shop.

ELKHORN, WIS.—A 2-story addition, 40 x 65 feet, will be built by the Frank Holton Band Instrument Co. Plans are being completed by M. Tullgran & Son, Milwaukee architects.

GREENFIELD, WIS.—The Wisconsin Gray Iron Foundry Co. has been incorporated with $30,000 capital stock by John A. Burke, Edward T. Freeman and Leo A. Mullaney, 605 Matthews building, Milwaukee.

HAYWARD, WIS.—The big sawmill here owned by the Edward Hines Lumber Co., of Chicago, damaged by fire May 9, with a loss of $150,000, probably will be rebuilt this year.

KAUKAUNA, WIS.—Hayes & Langdon, Janesville, Wis., have the general cotrnact to build the Kaukauna high school and industrial institute, to cost $250,000.

KENOSHA, WIS.—Contracts have been let by Krisor Bros. for a $25,000 public garage and repair shop, 60 x 109 feet, at 772-774 Milwaukee avenue.

KENOSHA, WIS.—Architects White & Co. are taking bids for a $25,000 addition to the garage and repair shop of the Roblicki Garage Co. at 267 West Main street. The building will be 53 x 100 feet.

MILWAUKEE—The Van Buren Garage, 201 Martin street, completed about six months ago, will be enlarged by a 1-story addition, 90 x 128 feet, at a cost of about $62,000.

MILWAUKEE—The Schwartz Box Co. has been incorporated for $25,000 by Edward G. Jung and A. J. O'Connor to make a general line of containers and packages.

West of the Mississippi

OAKLAND, CAL.—The Westgate Metal Products Co., recently organized with $2,500,000 capital stock, plans to establish a plant for the manufacture of iron and steel castings, etc. B. I. Marshall and A. T. Burch, 78 El Camino street, are officers of the company.

BRECKENRIDGE, COL.—The American Smelting & Refining Co. is reported planning additions and improvements to its plants.

PUEBLO, COL.—The Western Die Casting Co., 2927 Newbury street, Berkeley, Cal., is reported planning a plant here for the manufacture of carburetors, to cost $45,000.

LEOTI, KANS.—This city plans a power plant at an estimated cost of $24,000.

JEFFERSON CITY, MO.—The Jefferson City Light, Heat & Power Co. plans extensions to its power plant at a cost of $40,000.

AUSTIN, TEX.—The Woodward Mfg. Co. plans to rebuild its woodworking plant which was recently damaged by fire.

BELLINGHAM, WASH.—The Pacific Northwest Traction Co. will spend $250,000 within the next year in replacing several bridges and otherwise making betterments to its system.

SEATTLE—The Barde Steel & Machinery Co. has been incorporated with $100,000 capital stock by L. B. and Sophye Barde.

SEATTLE—The Western Pipe & Steel Co. has been incorporated with $500,000 capital stock and has leased a former shipyard which it is converting into a steel pipe factory.

Business in Canada

TORONTO, ONT.—The All-Four Tractors, Ltd., has been incorporated with $100,000 capital stock, by William E. Summerville, George A. T. Tuckey and J. C. MacIver.

TORONTO, ONT.—The National Tractors, Ltd., has been incorporated to manufacture tractors, etc., with $1,500,000 capital stock, by Newton M. Young, Paul J. B. Hinds and John S. Duggan.

New Trade Publications

TOOL STEELS—The McInnes Steel Co., Ltd., Corry, Pa., has published a 28-page illustrated booklet in which hammered crucible tool steels are described. The pages of the booklet are devoted to the discussion of treatments, such as forging, hardening and tempering, for the various steels.

FURNACES—The W. S. Rockwell Co., New York, is circulating a 16-page illustrated booklet in which heat-treating furnaces of the stationary type are described and illustrated. In addition the booklet devotes considerable space to illustrating practical methods of heating and handling.

BOLTS AND NUTS—The Lake Erie Bolt & Nut Co., Cleveland, has published a 144-page bolt and nut handbook. The features set forth in the book include standards of manufacture of the company, which furnish a valuable guide to all users of bolts and nuts. Terms of sale and instructions for ordering are also given. Specifications of the various kinds and types of bolts and nuts made by the company are given. A feature of the booklet is the thumb index which is an aid in locating any particular kind of bolt of nut in which a user might be interested, with the least possible waste of time.

VISES—The Athol Machine & Foundry Co., Athol, Mass., is circulating a 40-page illustrated catalog in which vises, hardware specialties and machinery are described and illustrated. In addition to the vises, the tools and machinery described include a household grindstone, iron grindstone frame, adjustable grindstone truer, bench grinder countershaft, bench grinders and hardware specialties. Complete data and specifications are given.

RIVETS—The Champion Rivet Co., Cleveland, has published a 68-page illustrated booklet in which practical information relative to boiler, ship and structural rivets is given. The information includes the standard specifications of the American Society for Testing Materials for boiler rivet steel. Some general information is given including millimeter equivalents in inches. The various rivets are described in detail, specifications being given.

STEEL BELT CONVEYORS—The Sandvik Steel Works Co., Ltd., Sandviken, Sweden, with an office in New York, has published a 24-page illustrated booklet in which steel belt conveyors are described and illustrated. These resemble ordinary band conveyors with textile or rubber coated belts, departures in design resulting, it is claimed, in simplicity, reduced upkeep, etc. The conveyor belts are made of charcoal steel by a special process, cold-rolled, hardened and tempered. They are made in one-piece lengths of 250 to 325 feet, in various widths. It is claimed they will efficiently carry materials such as sugar, sugar-beet pulp, fats, clay, coal, ore, sand, cement, cement clinker, wood, etc. Material can be unloaded at any desired point by means of a scraper device. The belt is elastic and may be arranged to run on roller idler supports or to slide on wood runners. A complete description, which is augmented by numerous illustrations, is given.

"WHEELING QUALITY CASTINGS"

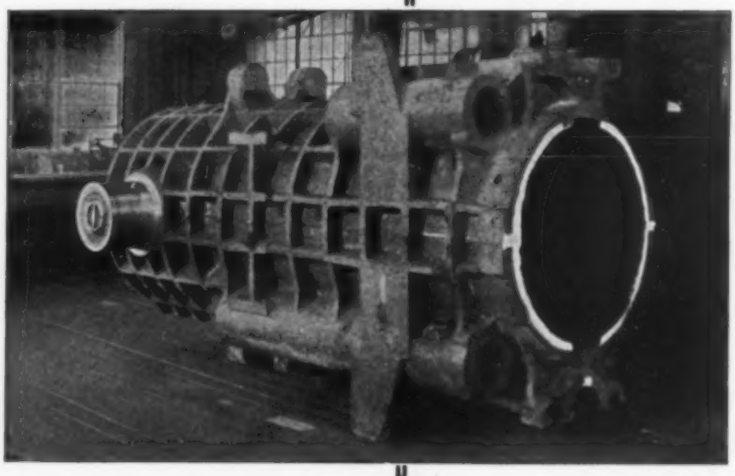
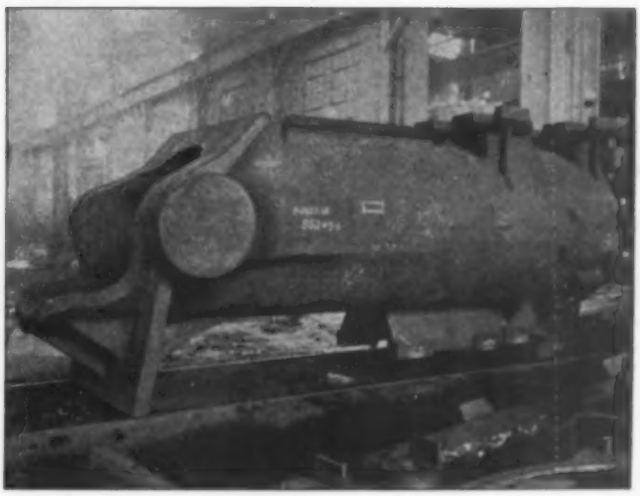


Illustration on left shows a 16" cradle Steel Casting, furnished Watertown Arsenal for Coast Defense Guns. Weight 110,000 lbs.

Steel Rolls
Supersteel Rolls
Chilled Rolls
Sand Rolls
Steel Castings
Iron Castings
Rolling Mill
and
Special Machinery

May we quote on your specifications?



Showing a 16" Gunslide, Steel Casting furnished the Navy Department. Weight 55,000 lbs.

WHEELING MOLD & FOUNDRY CO.

WHEELING, W. VA.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$10.50 to 11.50
Boston (dealers)	10.50 to 11.00
Buffalo	16.50 to 16.75
Chicago	14.25 to 14.75
Cincinnati	13.00 to 13.50
Cleveland	15.25 to 15.50
Detroit (dealers)	12.75 to 13.25
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	9.75 to 10.75
Pittsburgh	17.00 to 17.50
San Francisco	9.00 to 10.00
St. Louis	13.50 to 14.00
Valleys	17.25 to 17.50
No. 1 railroad steel New York (dealers)	12.00 to 12.50

BUNDLED SHEETS

Buffalo	$11.00 to 11.50
Cleveland (hydraulic)	12.75 to 13.25
Cincinnati	7.00 to 7.50
Eastern Pennsylvania	13.00 to 13.50
Pittsburgh	14.50 to 15.00
St. Louis	6.50 to 7.00
Valleys (hydraulic)	15.00 to 15.50

STEEL RAILS, SHORT

Birmingham	$12.50 to 13.00
Boston (dealers)	10.00 to 11.00
Chicago	16.00 to 16.50
Cincinnati	14.00 to 14.50
Cleveland	13.75 to 14.25
St. Louis	15.50 to 16.00

STOVE PLATE

Birmingham	$14.00 to 15.00
Boston (consumers)	13.00 to 13.50
Buffalo	15.00 to 15.50
Chicago	15.50 to 16.00
Cincinnati (net)	11.00 to 11.50
Cleveland	14.00 to 14.50
Detroit	11.00 to 11.50
Eastern Pennsylvania	15.00
New York	10.00 to 10.50
Pittsburgh	15.00 to 15.50
St. Louis	14.50 to 15.00

LOW PHOSPHORUS

Buffalo	$18.00 to 18.50
Cincinnati	17.00 to 17.50
Eastern Pennsylvania	18.00 to 20.00
Pitts. billet and bloom crops	20.00 to 21.00

SHOVELING STEEL

Chicago	$13.75 to 14.25
Pittsburgh	14.50 to 15.00
St. Louis	12.75 to 13.25

KNUCKLES, COUPLERS & SPRINGS

Chicago	$15.50 to 16.00
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	17.50 to 18.00
St. Louis	17.50 to 18.00

COMPRESSED SHEETS

Buffalo	$14.25 to 14.75
Chicago	11.50 to 12.00
Pittsburgh	15.25 to 15.75

FROGS, SWITCHES, GUARDS

Chicago	$14.25 to 14.75
Eastern Pennsylvania	15.00 to 16.00
St. Louis	14.50 to 15.00

BOILER PLATE, CUT

Detroit (dealers)	$8.00
St. Louis (dealers)	10.00 to 10.50

ANGLE BARS—STEEL

Chicago	$15.00 to 15.50
St. Louis	15.50 to 16.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$12.00 to 13.00
Boston (dealers)	12.00 to 12.50
Buffalo	15.00 to 16.00
Chicago, No. 1	13.75 to 14.25
Chicago, No. 2	14.25 to 14.75
Cincinnati, No. 1	12.00 to 12.50
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	17.00 to 17.50
Pittsburgh, No. 1	15.00 to 15.50
Pittsburgh, No. 2	17.00 to 17.50
New York, No. 1 (dealers)	12.50 to 13.00
St. Louis, No. 1	14.50 to 15.00
St. Louis, No. 2	14.00 to 14.50

WROUGHT PIPE

Boston (dealers)	$8.75 to 9.25
Buffalo	12.00 to 12.50
Eastern Pennsylvania	14.00 to 15.00
New York (dealers)	9.50 to 10.00

YARD WROUGHT

Boston	$9.00 to 10.00
Eastern Pennsylvania, No. 1	15.00 to 16.00

CITY WROUGHT

New York, long	$10.75 to 11.25

BUSHELING

Buffalo, No. 1	$14.00 to 14.50
Chicago, No. 1	12.50 to 13.00
Chicago, No. 2	8.00 to 8.50
Cincinnati, No. 1	10.00 to 10.50
Cleveland, No. 1	11.00 to 11.25
Cleveland, No. 2	9.00 to 9.50
Eastern Pennsylvania, No. 1	14.50 to 15.00
Pittsburgh, No. 1	13.50 to 14.00
St. Louis, No. 1	12.00 to 12.50

MACHINE SHOP TURNINGS

Birmingham	$6.00 to 7.00
Boston (dealers)	8.00 to 8.50
Buffalo	10.50 to 11.50
Chicago	7.50 to 8.00
Cincinnati (net)	6.00 to 6.50
Cleveland	11.50 to 11.75
Detroit (dealers)	8.00 to 8.50
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	9.50 to 10.00
Pittsburgh	13.50 to 14.00
St. Louis	8.50 to 9.00
Valleys	12.00 to 12.50

CAST IRON BORINGS

Birmingham (chemical)	$13.40 to 14.00
Birmingham, borings (plain)	6.00 to 6.50
Boston (chemical)	10.00 to 10.50
Boston (dealers)	7.50 to 8.00
Buffalo	11.50 to 12.00
Chicago	11.25 to 11.75
Cincinnati (net)	7.00 to 7.50
Cleveland	11.75 to 12.25
Detroit (dealers)	8.50 to 9.00
Eastern Pennsylvania	13.50 to 14.00
Eastern Pennsylvania (chemical)	15.50 to 16.00
Pittsburgh	14.00 to 14.50
New York (dealers' price)	9.50 to 10.00
St. Louis	9.50 to 10.00
Valleys	13.25 to 13.75

MIXED BORINGS AND TURNINGS

(For blast furnace use)

Boston (dealers)	$8.00 to 8.50
Cleveland	11.75 to 12.00
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	9.50 to 10.00

IRON AXLES

Birmingham	$17.00 to 18.00
Boston	$20.00 to 21.00
Buffalo	23.00
Chicago	24.50 to 25.00
Cincinnati	19.00 to 19.50
Detroit	19.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	20.00 to 21.50
Pittsburgh	24.00 to 25.00
St. Louis	25.00 to 25.50

IRON RAILS

Buffalo	$16.00 to 17.00
Chicago	18.00 to 18.50
Cincinnati	12.50 to 13.00
Cleveland	14.00 to 14.50
St. Louis	16.00 to 16.50

PIPES AND FLUES

Chicago	$10.00 to 10.50
Cincinnati	6.00 to 6.50
Cleveland	11.00 to 11.50
Detroit	7.00
St. Louis	9.50 to 10.00

RAILROAD GRATE BARS

Buffalo	$14.00 to 14.50
Chicago	14.00 to 14.50
Cleveland	14.00 to 14.50
Detroit	8.00 to 9.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	10.00 to 10.50
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	$6.50 to 7.00
Chicago, small	9.75 to 10.25
Cleveland, small	11.25 to 11.75
Cleveland, large	11.25 to 11.75
Detroit (dealers)	9.50 to 10.00

FORGE SCRAP

Boston	$4.50 to 5.00
Chicago	14.25 to 14.75
Eastern Pennsylvania, No. 1	12.00 to 12.50

ARCH BARS AND TRANSOMS

Chicago	$19.25 to 19.75
St. Louis	20.50 to 21.00

ANGLE BARS—IRON

Chicago	$18.50 to 19.00
St. Louis	18.00 to 18.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$7.50 to 8.00
Buffalo	13.50 to 14.00
Chicago	11.50 to 12.00
Cleveland	12.25 to 12.75
Detroit	10.00 to 10.50
Eastern Pennsylvania	13.00 to 14.00
Pittsburgh	15.00 to 15.50
St. Louis	11.00 to 11.50

STEEL CAR AXLES

Birmingham	$15.50 to 16.50
Boston (dealers)	14.00 to 14.50
Buffalo	18.00 to 19.00
Chicago	16.75 to 17.25
Cleveland	17.00 to 17.25
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	12.00 to 12.50
Pittsburgh	16.00 to 16.50
St. Louis	18.50 to 19.00

SHAFTING

Boston (dealers)	$13.50 to 14.00
Chicago	18.50 to 19.00
Eastern Pennsylvania	19.50 to 20.00
New York (dealers)	13.50 to 14.00
St. Louis	16.50 to 17.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$14.50 to 15.50
Birmingham, tram car	13.00 to 13.50
Boston (consumers)	18.00 to 18.50
Buffalo, iron	17.50 to 18.00
Chicago, iron	18.00 to 18.50
Cincinnati	14.00 to 14.50
Cleveland, iron	13.00 to 13.50
Detroit	13.50
Eastern Pennsylvania, iron	17.00 to 18.00
New York, iron (dealers)	14.00 to 15.00
Pittsburgh, iron	16.50 to 17.00
Pittsburgh, steel	17.50 to 18.00
St. Louis, iron	18.00 to 18.50

NO. 1 CAST SCRAP

Birmingham, cupola	$16.00 to 17.00
Boston (consumers)	18.50 to 19.00
Buffalo	18.00 to 18.50
Chicago, cupola	17.25 to 17.75
Cincinnati, No. 1, machinery, cupola (net)	14.50 to 15.00
Cleveland, cupola	17.00 to 17.50
Eastern Pennsylvania, cupola	18.00 to 19.00
New York, cupola (dealers)	14.00 to 14.50
Pittsburgh, cupola	18.50 to 19.00
San Francisco	23.00 to 24.00
St. Louis, agricultural	18.00 to 18.50
St. Louis, railroad	17.75 to 18.25
Valleys	17.75 to 18.25
Detroit, machinery (net)	14.50 to 15.00

HEAVY CAST

Boston (consumers)	$17.00 to 18.00
Buffalo	16.00 to 16.50
Cleveland	14.50 to 14.75
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	13.00 to 13.50
Pittsburgh	17.75 to 18.25
Detroit, automobile (net)	18.00 to 18.50

MALLEABLE

Boston (railroad)	$14.00 to 15.00
Buffalo	17.00 to 17.50
Chicago, railroad	16.50 to 17.00
Chicago, agricultural	16.50 to 17.00
Cincinnati, agricultural	11.00 to 11.50
Cincinnati, railroad	11.00 to 11.50
Cleveland, agricultural	12.50 to 13.00
Cleveland, railroad	15.25 to 15.50
Detroit	13.00
Eastern Pennsylvania, railroad	13.00 to 14.00
Pittsburgh, railroad	16.00 to 16.50
Pittsburgh, agricultural	13.00 to 13.50
St. Louis, agricultural	14.00 to 14.50
St. Louis, railroad	14.25 to 14.75

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Birmingham	$15.00 to 16.00
Boston (dealers)	11.50 to 12.00
Chicago	15.50 to 16.00
Cleveland	16.00 to 16.50
Detroit (dealers)	10.00 to 10.50
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	13.50 to 14.50
Pittsburgh district	17.50 to 18.00
St. Louis	15.00 to 15.50

LOCOMOTIVE TIRES

Chicago	$13.00 to 13.50
St. Louis	14.00 to 15.00

LOW PHOSPHORUS PUNCHINGS

Chicago	$15.00 to 15.50
Eastern Pennsylvania	19.00 to 21.00
Pittsburgh	17.50 to 18.00

LOGEMANN

Double Ram Hydraulic

Scrap-Metal Presses

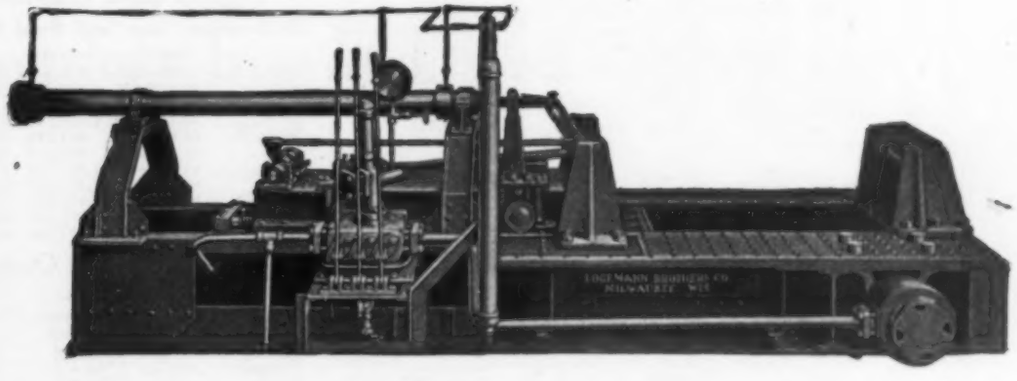
STANDARD

In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
Compare this with prices paid for "hydraulic-compressed."

LOGEMANN BROTHERS CO., 3126 Burleigh St. MILWAUKEE, WIS.



We build Balers for All Purposes

Hand-balers for waste-paper, power and hydraulic balers for the textile trades, hydraulic presses for metal and waste trades.

Also Hydraulic Shaft Straighteners, Etc.

Iron and Steel Production

Compiled By THE IRON TRADE REVIEW

Pig Iron

	Stacks No.	Stacks In	Output Total	Output Av. daily
1907				
January	376	311	2,174,801	69,509
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,299,732	
1908				
January	398	139	1,081,813	34,316
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,680,140	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,186
October	413	309	2,589,681	84,001
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,337,002	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,747
March	417	310	2,588,736	83,580
April	418	291	2,477,700	82,590
May	421	206	1,871,388	60,367
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,793	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,192
Total			26,840,314	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,867
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,287,800	89,929
February	423	306	2,778,670	92,095
March	423	278	2,562,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,716,825	90,865
June	422	283	2,816,883	87,229
July	422	264	2,658,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,594,098	83,137
October	425	244	2,439,924	81,933
November	424	225	2,529,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,324	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,516	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	355	3,238,970	104,483
September	431	344	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,794
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,602
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,270
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,981	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,168
September	434	317	3,124,308	104,173
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,927,088	68,906
March	436	103	1,593,542	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	435	69	954,901	30,802
September	435	84	985,795	32,857
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,545,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,034,784	65,638
April	429	161	2,070,238	69,008

Ingots and Castings

By American Iron and Steel Institute

	Ingots	Castings	Total
1910	25,154,087	940,832	26,094,919
1911	23,029,479	646,627	23,676,106
1912	30,284,682	966,621	31,251,303
1913	30,280,130	1,020,744	31,300,874
1914	22,819,784	693,246	23,513,030
1915	31,284,212	866,824	32,151,036
1916	41,401,917	1,371,763	42,773,680
1917	43,619,200	1,441,407	45,060,607
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934

Monthly Ingot Output

Gross Tons

1921	84.2 per cent of capacity	Indicated total
January	2,203,186	2,620,000
February	1,749,477	2,080,000
March	1,570,972	1,860,000
April	1,213,958	1,440,000
May	1,265,850	1,500,000
June	1,003,406	1,190,000
July	803,376	955,000
August	1,138,071	1,350,000
September	1,174,740	1,400,000
October	1,616,810	1,900,000
November	1,660,001	1,970,000
December	1,427,093	1,680,000
Total	16,826,946	19,945,000
1922		
January	1,593,482	1,890,000
February	1,745,022	2,075,000
March	2,370,751	2,820,000
April	2,439,246	2,900,000

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	729,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	203,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	667,300	281,700	92,700	58,000
1921				
January	642,100	288,000	110,600	93,500
February	463,600	287,400	103,700	81,700
March	386,000	295,300	104,700	27,600
April	60,300	287,700	94,700	70,800
May	13,600	278,100	74,600	78,700
June	800	280,900	67,400	81,700
July	10,200	262,400	44,600	70,000
August	94,200	250,800	43,800	72,800
September	158,300	239,800	59,800	86,200
October	235,500	251,800	45,800	98,800
November	271,800	290,000	59,800	92,400
December	275,000	296,300	73,000	100,800
Total for 1921	2,611,400	3,308,500	862,500	955,000
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	.....	130,900

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	754,700	250,200	101,300	49,000
1921				
January	493,400	263,700	119,100	70,800
February	483,500	259,600	98,400	62,000
March	359,100	246,900	96,300	19,700
April	70,600	252,600	108,700	57,100
May	5,700	240,400	62,800	56,100
June	2,700	240,800	54,200	61,000
July	117,200	219,500	26,900	57,100
August	434,100	228,600	27,800	55,100
September	429,300	232,100	34,000	76,200
October	405,400	255,900	41,900	81,800
November	443,800	272,700	46,200	69,900
December	381,000	297,600	63,200	80,700
Total for 1921	3,625,800	3,010,400	779,500	747,500
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	.....	.....	99,200

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
1921				
January	157,800	44,200		
February	153,400	35,400	120,100	125,000*
March	156,100	33,900		
April	102,100	26,100		
May	81,900	31,700	95,500	36,000
June	84,500	20,700		42,100
July	103,600	30,300		45,100
August	141,500	16,100	130,600	61,200
September	206,100	27,900		79,800
October	172,800	19,800		96,600
November	169,200	20,700	168,000	54,300
December	117,000	.....		56,300
Total for 1921	1,646,000	.....	514,200	596,400*
1922				
January	88,700	.....	.....	68,200
February	64,600	.....	.....	66,900
March	63,800	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	516,900
Average monthly 1919..	186,100	19,400	14,500	.....
Average monthly 1920..	271,100	74,600	74,300	143,600
1921				
January	232,400	89,300		
February	166,900	125,800	294,000	503,600*
March	148,900	122,700		
April	160,100	117,400		.....
May	99,000	96,900	241,300	127,800
June	64,700	109,100		159,700
July	64,000	87,600		175,000
August	76,500	122,500	192,300	236,300
September	133,300	171,200		221,800
October	155,800	188,300		242,300
November	193,500	167,400	176,000	230,600
December	205,300	.....		212,900
Total for 1921	1,700,400	903,600	.....	2,110,000*
1922				
January	253,300	.....	.....	218,200
February	223,400	.....	.....	170,000
March	295,800	.....	.....	.....

*Provisional estimate owing to absence of German figures for first four months of 1921.

Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1922		
March	8,612	206,474
February	10,216	133,333
January	10,511	155,822
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	23,316	142,553
April	4,935	162,793
March	4,505	230,253
February	3,672	394,638
January	15,784	516,447
Total	119,629	2,187,822
1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
December	39,806	254,780
November	43,826	336,994
October	40,698	302,459
September	43,567	363,531
August	28,987	396,743
July	28,258	287,685
June	21,056	561,020
May	17,885	422,282
April	16,560	396,813
March	17,632	367,224
February	12,302	344,180
January	16,913	371,579
Total	327,490	4,405,281
1918		
December	28,996	356,641
November	11,582	471,427
October	15,744	426,767
September	8,440	473,688
August	12,520	512,104
July	11,511	452,759
June	13,913	418,605
May	14,387	488,515
April	11,371	462,887
March	14,345	379,924
February	12,941	438,848
January	12,475	490,259
Total	168,225	5,372,424
1917		
December	14,642	653,344
November	13,995	473,549
October	14,310	571,868
September	19,058	499,067
August	26,129	503,075
July	28,859	346,393
June	29,080	629,305
May	26,479	582,303
April	48,213	519,397
March	37,943	606,559
February	24,947	449,099
January	40,910	608,281
Total	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	362,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

Composite Market Record

Monthly Averages of Fourteen Iron and Steel Products, 1913-1922, Compiled by The Iron Trade Review

1922	
May 25	$36.62
May 17	36.60
May 10	36.50
May 3	36.08
Average for April	34.42
April 26	35.44
April 19	34.75
April 12	34.02
April 5	33.45
March	32.97
February	32.86
January	33.35
1921	
December	33.99
November	34.71
October	35.46
September	35.34
August	35.99
July	38.14
June	41.87
May	43.32
April	43.84
March	45.37
February	48.81
January	51.98
Average for year	40.74
1920	
December	54.04
November	63.75
October	$68.61
September	69.28
August	68.93
July	68.29
June	67.89
May	68.26
April	67.49
March	65.47
February	65.63
January	59.40
Average for year	65.59
1919	
December	54.88
November	51.28
October	48.76
September	48.35
August	48.27
July	47.86
June	47.88
May	48.29
April	48.45
March	52.28
February	53.71
January	53.81
Average for year	50.32
1918	
December	57.24
November	55.67
October	57.53
September	$56.56
August	56.67
July	56.66
June	56.62
May	56.59
April	56.59
March	56.71
February	56.67
January	56.67
Average for year	56.68
1917	
December	56.68
November	58.29
October	67.75
September	83.18
August	89.69
July	89.56
June	82.66
May	73.96
April	66.48
March	61.07
February	56.76
January	55.10
Average for year	70.10
1916	
December	53.68
November	46.77
October	41.50
September	39.97
August	$39.67
July	38.37
June	39.63
May	39.78
April	39.13
March	37.18
February	35.63
January	33.66
Average for year	40.50
1915	
December	31.56
November	28.64
October	26.19
September	25.55
August	24.77
July	24.25
June	23.74
May	22.89
April	22.66
March	22.71
February	22.21
January	21.90
Average for year	24.76
1914	
December	21.58
November	23.39
October	$22.84
September	23.17
August	22.72
July	22.17
June	22.58
May	22.99
April	23.39
March	23.60
February	23.52
January	23.03
Average for year	22.92
1913	
December	23.29
November	24.02
October	24.91
September	25.55
August	25.97
July	26.34
June	26.78
May	27.34
April	27.74
March	27.93
February	28.05
January	27.96
Average for year	26.32

Iron and Steel Statistics

Tin Plate Production

Year	Tin plate Tons	Terne plate Tons	Total Tons
1908	524,448	77,090	601,538
1909	589,929	95,465	685,394
1910	725,411	84,092	809,503
1911	798,814	79,221	878,035
1912	982,830	95,698	1,078,528
1913	854,093	68,472	922,565
1914	969,892	73,098	1,042,990
1915	1,100,913	81,735	1,182,648
1916	1,276,113	107,088	1,383,201
1917	1,616,658	76,946	1,693,604
1918	1,608,124	42,689	1,650,813
1919	1,203,579	85,427	1,289,006
1920	1,539,977	69,112	1,609,089

Sheet Production

Year	Tons
1913	1,921,001
1914	1,668,644
1915	2,106,298
1916	2,492,794
1917	2,595,606
1918	2,176,537
1919	2,316,057
1920	3,133,217

Plate Production

Year	Sheared Tons	Universal Tons	Total Tons
1913	1,844,354	1,158,416	3,002,770
1914	1,346,308	766,133	2,112,441
1915	1,923,199	954,852	2,878,051
1916	2,453,150	1,224,234	3,677,384
1917	2,963,039	1,195,199	4,158,238
1918	3,885,126	1,234,782	5,119,908
1919	2,899,967	992,054	3,892,021
1920	3,505,364	1,249,769	4,755,133

Shape Production

Year	Gross tons
1908	1,083,181
1909	2,275,562
1910	2,266,890
1911	1,912,367
1912	2,846,487
1913	3,004,972
1914	2,031,124
1915	2,437,003
1916	3,029,964
1917	3,110,000
1918	2,849,969
1919	2,614,036
1920	3,306,748

Bar Production

Year	Gross Tons Iron Tons	Steel Tons	Total Tons
1908	685,233	1,301,405	1,986,638
1909	952,230	2,311,301	3,263,531
1910	1,074,163	2,711,568	3,785,731
1911	835,625	2,211,737	3,047,362
1912	944,790	2,752,324	3,697,114
1913	1,026,632	2,930,977	3,957,609
1914	563,171	1,960,460	2,523,631
1915	657,107	3,474,135	4,131,242
1916	993,948	5,236,354	6,230,302
1917	983,926	5,226,031	6,209,957
1918	846,898	5,395,851	6,242,749
1919	446,549	3,945,075	4,391,624
1920	663,032	5,467,208	6,130,240

Tube Production

	Iron	Steel	Total
1913	276,067	1,969,465	2,245,532
1914	212,147	1,525,557	1,737,704
1915	206,513	1,713,161	1,919,674
1916	278,117	2,372,941	2,651,058
1917	273,890	2,213,087	2,486,977
1918	202,958	2,087,521	2,290,479
1919	162,356	2,212,575	2,374,931
1920	199,673	2,803,052	3,002,725

Steel Rail Production

Year	Tons
1908	1,920,944
1909	3,023,845
1910	3,635,801
1911	2,822,556
1912	3,327,915
1913	3,502,780
1914	1,945,095
1915	2,204,203
1916	2,854,518
1917	2,944,161
1918	2,540,892
1919	2,203,843
1920	2,604,116

Freight Rates

Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.96
Newark, N. J.	6.72
Boston	7.28
Philadelphia	6.32
Pittsburgh	1.96
Chicago	5.32
St. Louis	6.44
Minneapolis, St. Paul	7.60
Buffalo to:	
Albany, N. Y.	$2.52
New England (rail)	5.46
New York and Brooklyn (rail)	5.46
Virginia furnaces to:	
Philadelphia	$5.74
New England	6.58
Brooklyn, Jersey City, Newark	6.16
Birmingham, Ala., to:	
Boston	$10.665
Boston (rail and water)	7.65
Cincinnati	4.50
Chicago	6.66
Cleveland	6.66
Louisville, Ky.	4.12
Minneapolis, St. Paul	9.73
New York	10.265
Philadelphia	8.665
Pittsburgh	7.60
Savannah, Ga.	4.25
St. Louis	5.725
Chicago to:	
Des Moines	$4.725
Minneapolis, St. Paul	3.375
Milwaukee	0.89
Moline, Ill.	1.89
Omaha	6.07
St. Louis	2.80
Ironton and Jackson, O., to:	
Chicago	$5.32
Cincinnati	2.52
Cleveland	3.36
Detroit	3.64
Indianapolis	3.22
Minneapolis, St. Paul	8.40

Finished Material

Pittsburgh, carloads, per 100 pounds, to:	
New York	$0.38
Philadelphia	0.36
Baltimore	0.35
Boston	0.405
Buffalo	0.295
Baltimore	0.35
Cleveland	0.24
Cincinnati	0.32
Chicago	0.38
Detroit	0.32
Minneapolis and St. Paul	0.66
Kansas City	0.815
Denver	1.32
St. Louis	0.475
New Orleans	0.515
Birmingham	0.765
Pacific coast (all rail)	1.665
Pacific coast (tin plate)	1.665